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SIGNS OF MALNUTRITION IN CANADA

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NO simple system has yet been devised for the assessment of malnutrition. A record of foods ingested gives little indication of the probable results because individuals vary in their requirements and in their ability to adapt themselves to altered conditions. They also vary in the extent to which they utilize a seemingly adequate intake of food. Biochemical tests in blood and urine have such wide variations in apparently healthy people that they become difficult to interpret. Clinical signs that have come in recent years to be associated with forms of malnutrition short of the rarely seen classical deficiency diseases, are so unspecific that their use has been a pitfall. Even a therapeutic test has sometimes precipitated more trouble, due to the imbalance created.

Physicians now realize that the spectacular results sometimes obtained with vitamins, for example, are not always, or even usually, obtained in routine practice. This failure in practice is sometimes due to the use of one or another unspecific sign as a diagnostic clue, in the absence of confirmatory evidence from the diet or from functional, biochemical or therapeutic tests. Practitioners and public health officers alike realize the importance of nutrition in health and in the treatment of disease, but they have no adequate systematic information on how to proceed.

Information is far from complete on which to assess milder forms of malnutrition. This paper is presented in the hope that it may be helpful to those who wish to do something in this field, and that it may stimulate the many observations that are still needed before nutritional assessments can be made with assurance. The frequency with which certain of these unspecific signs of malnutrition have been encountered among some 6,000 Canadians, is listed, together with other information. Since these Canadians were examined in regions that were not statistically random in selection, these figures do not represent "national average" results, but they do illustrate both a method of procedure, and the kind of results that may be encountered.

The pendulum is swinging away from the preoccupation with vitamins and returning to emphasis on sufficient (but not over-abundant) calories, on amino acids, and on minerals—in short, to emphasis on the whole being and a balanced dietary. The recognition of anti-vitamins of anti-calcifying factors, of bacterial synthesis, and of the advantages and disadvantages of accumulations of metabolic products has complicated the picture. Dietary standards (Pett[1]) serve only as a guide in the feeding of patients or others; other information is needed.

TABLE I.

CANADA'S FOOD RULES

These foods are good to eat.
Eat them every day for health.
Have at least three meals each day.

1. MILK—Children (up to about 12 years): at least 1 pint.
   Adolescents: at least 1½ pints.
   Adults: at least ½ pint.
2. FRUIT—One serving of citrus fruit or tomatoes or their juices; and
   One serving of other fruit.
3. VEGETABLES—At least one serving of potatoes; and at least two servings of other vegetables, preferably leafy, green or yellow and frequently raw.
4. CEREALS AND BREAD—One serving of whole grain cereal, and at least four slices of bread (with butter or fortified margarine).
5. MEAT AND FISH—One serving of meat, fish, poultry, or meat alternates such as dried beans, eggs and cheese.
   Use LIVER frequently.
   In addition:
   EGGS AND CHEESE at least three times a week each.

VITAMIN D—At least 400 International Units daily for all growing persons and expectant and nursing mothers.

IODIZED SALT is recommended.

Malnutrition may occur in four overlapping stages:

1. Inadequate ingestion of food, or of specific nutrients; or the interference with absorption and utilization that permits malnutrition on a seemingly adequate diet (conditioning factors).

2. Decreased bodily reserves; sometimes detectable by biochemical analyses.

3. Impaired function, even though no tissue changes are noted.

4. Structural changes in visible tissues, which is the usual clinical assessment at the present time. Unless such structural changes are correlated with each other, and with such confirmation as may be obtained from a dietary history, from laboratory tests or from a therapeutic trial, then the clinical assessment will err many times.

EARLY SYMPTOMS

Abnormalities of growth, malfunction of the gastro-intestinal tract and any physiological or pathological stresses must be noted. Early symptoms of malnutrition are especially vague and unspecific. They include lack of appetite, underweight or overweight, retarded development mentally or physically, fatigue, insomnia, lassitude, emotional upsets, paræsthesias of hands or feet, altered bowel function, easy bruising, and œdema. Only occasionally do such symptoms indicate malnutrition. Confirmatory evidence from biochemistry or diet history or special clinical signs may help in their interpretation.

DIETARY HISTORY

A diet history is of the greatest importance not only to confirm or question other findings but also to form the basis of any advice for improvement. We must start with what the patient is eating, and encourage, perhaps one item at a time, the foods needed most. Canada's Food Rules as presented in Table I, and discussed recently by Pett,[1] indicate a probably adequate diet pattern. When considered along with Table II listing food sources of various nutrients, they can form a basis for questioning the patient and for advice on how

TABLE II.

FOOD SOURCES OF DIETARY ESSENTIALS

Arranged with the richest source first, on the basis of average servings, but for raw foods.

Protein		*Calcium*		*Iron*		*Vitamin A*	
Grams per serving		*Grams per serving*		*Milligrams per serving*		*Int. units per serving*	
Fish (4 oz.)	25	Whole milk (8 oz.)	0.28	Liver (4 oz.)	14	Liver	22,000
Chicken	23	Cheddar cheese (1")	0.18	Kidney	8	Carrots	12,000
Liver	23	Whitefish	0.17	Beans, navy	5	Sweet potato	19,000
Veal	22	Beans, navy	0.07	Veal	3	Spinach	9,000
Beef	20	Molasses	0.06	Pork	2	Canteloupe	6,200
Pork	14	Turnip	0.04	Prunes	1	Peaches	1,400
Sausage	12	Cottage cheese	0.04	Molasses (1 tbsp.)	1	Tomatoes	1,100
Beans, navy	10	Light cream	0.03	Egg	1	Egg	510
Cottage cheese	9			Raisins (1 oz.)	1	Butter (1 tbsp.)	500
Whole milk (8 oz.)	8			Bread, whole wheat	1	Margarine, fortified	500
Egg (one)	6					Peas, canned	460
Cheddar cheese	5					Whole milk	380
Peanut butter (½ oz.)	4					Cheddar cheese (1")	350
Bread	3						

Thiamine		*Riboflavin*		*Niacin*		*Ascorbic acid (C)*	
Milligrams per serving		*Milligrams per serving*		*Milligrams per serving*		*Milligrams per serving (raw food)*	
Pork (4 oz.)	0.86	Liver (4 oz.)	3.2	Liver (4 oz.)	18	Canteloupe, half	62
Kidney	0.52	Kidney	2.2	Lamb	12	Strawberries, ten	58
Liver	0.31	Whole milk (8 oz.)	0.43	Chicken	10	Spinach (raw)	55
Beans, navy	0.27	Veal	0.31	Kidney	8	Oranges, one	54
Lamb, veal, etc.	0.20	Chicken	0.21	Salmon	8	Apple juice, vitaminized (4 oz.)	46
Rolled oats	0.18	Sausage	0.17	Veal	7	Turnip, raw	27
Cracked wheat	0.14	Beef	0.16	Beef	5	Cabbage, ½ cup raw	26
Potato (one)	0.14	Cottage cheese	0.13	Pork	4	Potato, one, raw	21
Beef	0.13	Cheddar cheese (1" cube)	0.10	Peanut butter, 1 tbsp.	2	Tomato, one	19
Chicken	0.13	Bread, whole wheat	0.03	Bread, whole wheat, 1 slice	1	Salmon	10
Peas	0.13					Peach, one	7
Whole milk	0.10					Apple, one	6
Bread, whole wheat, 1 slice	0.05						

to improve the diet. For example, if an adult says he gets about one-half pint of milk a week, and if a similar pattern continued for most of the food groups, then he would be classified as having an "inadequate diet". It is hoped at a later date to illustrate various ways of evaluating diets; for the present it may be mentioned that any intake of less than half the foods indicated in Canada's Food Rules may be useful in corroborating other findings. In the milk illustration above, such an individual might show cheilosis and angular stomatitis, thereby classifying as riboflavin deficient, but if the milk consumption were reported as adequate, one could not be as sure of the diagnosis. If the man preferred to eat liver, rather than drink milk, then Table II would show that this would help to supply the needed riboflavin.

TABLE III.

CONDITIONING FACTORS THAT MAY CONTRIBUTE TO NUTRITIONAL FAILURE

1. By interfering with food intake

1. Loss of teeth.
2. Food allergies.
3. Psychiatric disorders, as juvenile tension states, psychoneuroses, psychoses.
4. Migraine.
5. Gastro-intestinal diseases, as diarrhœal diseases, acute gastro-enteritis, peptic ulcer, carcinoma, cholecystitis and cholelithiasis.
6. Operations and anæsthesia.
7. Infectious diseases associated with anorexia.
8. Heart failure (anorexia, nausea).
9. Toxæmia of pregnancy (nausea and vomiting).
10. Visceral pain, as renal colic.
11. Pulmonary disease (anorexia, vomiting due to cough).

2. By interfering with absorption

1. Diarrhœal diseases, as ulcerative and mucous colitis, intestinal parasites, sprue, intestinal tuberculosis.
2. Diseases of liver and gallbladder.
3. Achlorhydria.
4. Anti-vitamins in food or produced in tract.
5. Use of nutrients by intestinal microflora.
6. Carcinoma.
7. Gastro-intestinal fistulas.

3. By interfering with utilization

1. Chronic alcoholism.
2. Liver disease.
3. Diabetes mellitus.
4. Antivitamins that have been absorbed.

4. By increasing requirement

1. Abnormal activity, as delirium.
2. Fever.
3. Hyperthyroidism.
4. Pregnancy and lactation.

5. By increasing excretion

1. Loss of proteins in nephrotic nephritis.
2. Polyuria, as in diabetes, urinary tract infections treated with long continued excessive fluid intake.
3. Lactation.
4. Biliary or gastro-intestinal fistula.

6. By therapeutic measures

1. Therapeutic diets, as in:—Sippy regimen, gallbladder disease, reducing diets.
2. Alkaline compounds.
3. Mineral oil.
4. Diuretics.
5. Fever therapy.
6. Paracentesis.

CONDITIONED MALNUTRITION

Conditioning factors interfere with the utilization of a diet, such as Canada's Food Rules, that seems to be adequate. Such conditioning factors are listed in Table III, which is an adaptation and extension of a table by Jolliffe and Smith.[2]

Nutrition surveys in different parts of Canada, of which results are used in this paper, record diets as being "inadequate" on the basis mentioned above. In any region there may be as many as 25% of the persons studied, on such diets. Many of these people seem to be perfectly healthy and show no evidence of malnutrition, presumably because their requirements are lower, or their adaptation is better. Conversely, some of the people on the better diets show evidence of malnutrition, presumably due to the operation of conditioning factors. In the latter case it becomes especially important to evaluate the tissue changes and the laboratory results. Table IV shows that such conditioned malnutrition may be quite important among Canadians.

LABORATORY TESTS

There is a vagueness about laboratory tests related to nutrients because the wide limits

TABLE IV.

Showing the prevalence of malnutrition on diets that approached adequacy (conditioned malnutrition) among Canadians, as well as among those on clearly inadequate diets. Figures give the percentage in each group on whom a definite or probable diagnosis was made.

Diagnosis	*Diet inadequate (1,070 persons)*		*Diet fairly adequate (3,701 persons)*	
	Indians	*Whites*	*Indians*	*Whites*
	%	%	%	%
1. Thinness	9.1	13.8	6.0	10.2
2. Low hæmoglobin	0	6.8	17.6	6.2
3. Riboflavin deficiency	27.3	26.7	22.5	9.7
4. Past rickets	0	14.5	8.3	11.8
5. Vitamin A deficiency	9.1	12.8	7.3	3.6
6. Ascorbic acid deficiency	0	3.6	0	1.2
7. Protein deficiency	0	0.3	0	0.2
8. Niacin deficiency	0	0.3	0.2	0.03

TABLE V.

The Percentage Rates of Certain Nutritional Deficiencies Among 6,057 Canadians, together with the percentage rates of some of the individual clinical signs that may be associated with such deficiencies. These figures do not indicate the extent of malnutrition in Canada since the sample is too small and too biased.

	Indian children				*Whites*									
Age and sex	*1 - 9*	*10 - 14*	*15 - 19*		*1 - 9*	*10 - 14*	*15 - 19*		*20 - 39*		*40 - 59*		*over 59*	
Number	*226*	*524*	*M. 37*	*F. 37*	*2,368*	*1,769*	*M. 160*	*F. 202*	*M. 123*	*F. 243*	*M. 128*	*F. 178*	*M. 30*	*F. 32*
1. Thinness	3.5	6.7	13.5	2.7	12.4	12.4	3.8	3.5	6.5	9.9	8.6	5.1	0	3.1
Criterion:—10% or more underweight and having a subcutaneous tissue measurement less than 4 to 9 mm. depending on age, and sex.														
(a) 10% or more underweight	5.8	10.7	18.9	5.4	12.3	18.5	18.8	16.3	22.8	33.3	32.8	24.2	0	0
(b) 10% or more overweight	9.7	17.0	5.4	24.3	8.6	11.4	9.4	17.8	12.2	24.3	12.5	32.6	0	0
2. Low hæmoglobin	25.2	14.1	5.4	18.9	9.1	4.6	3.8	5.0	1.6	15.2	3.9	12.4	10.0	18.8
Criterion:—Children under 12 years, and females of all ages: below 11.2 grams/100 ml. blood. Males 12 years and over: below 12.2 grams/100 ml. blood. These figures are adjusted slightly according to the distribution of the values in the area.														
3. Riboflavin deficiency. Definite	0	1.3	0	0	1.4	3.1	2.5	1.5	0	0	0	0	0	0
Criterion:—A diet low in milk and cheese plus at least 2 physical signs listed below or 3 signs regardless of diet. Can be confirmed by absent urinary excretion. Of those diagnosed riboflavin deficient 72% reported a low milk intake. Of the physical signs, cheilosis and a cobblestone tongue were the most frequently encountered in those on whom a diagnosis was made, with seborrhœic dermatitis of average frequency (28 to 44%), angular stomatitis in 7 to 30% and blepharitis 11 to 17%.														
Probable	12.8	22.1	10.8	2.7	12.1	12.9	14.4	11.9	0	2.9	3.9	2.8	6.7	6.2
Criterion:—Two physical signs or 1 sign confirmed by a diet low in milk and cheese.														
Single signs, in descending order of frequency in cases actually diagnosed.														
(a) Cheilosis (color plate No. 1)	0.4	1.9	0	2.7	14.7	14.1	22.5	2.5	2.4	1.6	3.1	1.1	3.3	6.2
(b) Pebbled tongue (color plates Nos. 2, 8)	0	0	0	0	22.0	14.6	3.8	3.0	0	1.2	0.8	1.1	0	0
(c) Acute angular stomatitis (color plate No. 3)	3.5	2.9	0	0	1.4	1.2	1.9	3.0	0	2.5	0.8	0.6	3.3	0
NOTE:—Of the group showing acute angular stomatitis 4.5% of the whites and 13% of the Indians were anæmic rather than riboflavin deficient.														
(d) Seborrhœic dermatitis (color plates Nos. 4, 5, 9)	0.4	1.9	2.7	8.1	1.1	7.4	10.6	13.4	0	0	0	0.6	0	0
(e) Blepharitis (color plate No. 6)	0.9	2.3	0	2.7	4.7	4.4	2.5	4.0	2.4	2.1	0	0.6	0	3.1
(f) Scars of angular stomatitis (color plates Nos. 7, 10)	43.8	44.8	59.5	67.6	6.7	7.5	22.5	23.8	11.4	12.8	14.8	10.1	6.7	0
NOTE:—Of the group showing scars of angular stomatitis 7% of whites and 16% of Indians were anæmic.														
4. Past rickets. Definite	5.3	1.5	2.7	0	8.7	6.9	3.1	1.0	not examined					
Criterion:—Any chest deformity described as rachitic.														
Probable	8.4	4.8	8.1	2.7	7.9	6.4	2.5	0	not examined					
Criterion:—Marked parietal bossing plus enlarged ulnar epiphyses.														
NOTE:—Among white children with evidence of past rickets 90% had markedly carious teeth compared with only 69% carious teeth in the group as a whole.														
(a) Chest deformity (color plates Nos. 11, 12)	5.3	1.5	2.7	0	8.7	6.8	3.1	1.0	....	....	....	....	....	....
(b) Parietal bossing	23.0	12.4	16.2	8.1	25.6	14.5	5.6	0.5	....	....	....	....	....	....
(c) Enlarged wrists	41.6	51.9	62.2	56.8	30.6	45.6	43.8	45.5	29.3	35.4	20.3	15.7	26.7	15.6
5. Vitamin A deficiency. Definite	0	0.6	0	2.7	0.6	0.2	0.6	0	0	0	0	0	0	0
Criterion:—A diet low in green and yellow vegetables plus at least two of the physical signs listed below. Can be confirmed by a serum level less than 20 micrograms vitamin A per 100 ml. serum. Of those diagnosed all had folliculosis, 53% had xerosis and 47% had follicular conjunctivitis.														
Probable	6.2	7.1	2.7	5.4	5.2	6.3	6.2	1.5	0.8	1.2	0	0	0	0

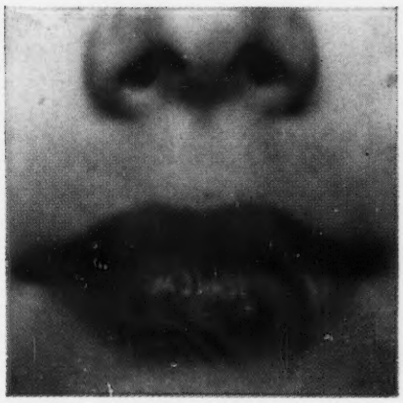

Plate 1.—Cheilosis or denuded epithelium with vertical striæ, often cracked This least specific of signs occurs often with other signs to aid the diagnosis of riboflavin deficiency.

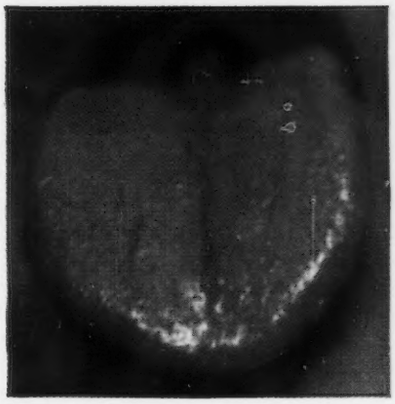

Plate 2.—Tongue with magenta colour and enlarged papillæ that may form variable fissures. May indicate riboflavin deficiency when associated with other evidence. See plate 8 for another "pebbled" tongue and fissures.

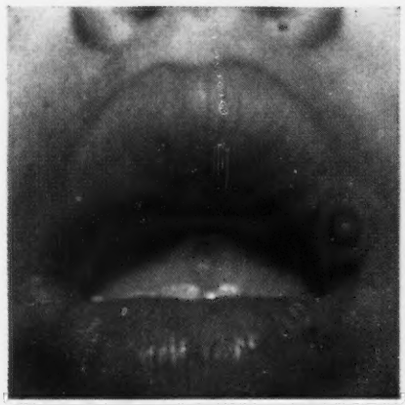

Plate 3.—Acute angular stomatitis, should be bilateral, and cross the muco-cutaneous border in an open crack on an erythematous base. Not common in riboflavin deficiency but other signs will confirm it.

Plate 4.—Seborrhœic dermatitis, at naso-labial fold, or at folds of the eye (Plate 5) or of the ear (Plate 9). Useful in diagnosis of riboflavin deficiency when confirmed by diet and other signs.

Plate 5.—Seborrhœic dermatitis—a greasy slightly erythematous dermatitis in sites not usual for ordinary seborrhœa, may be added evidence in making a diagnosis.

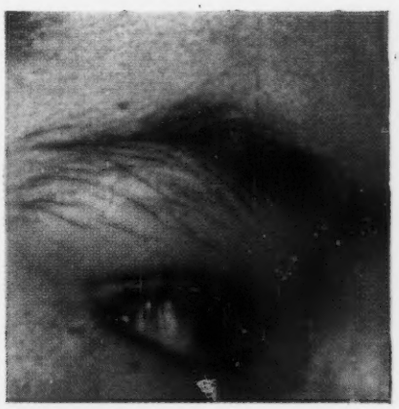

Plate 6.—Blepharitis, especially marginal, and not very acute, leading to flakes, may occasionally be due to riboflavin deficiency.

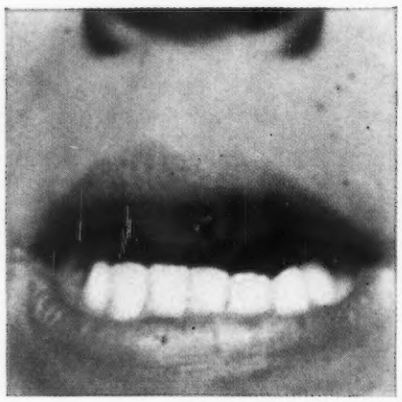

Plate 7.—Scars of angular stomatitis are not very useful in diagnosing current riboflavin deficiency, since they disappear slowly, if at all, but are useful as a clue to food habits.

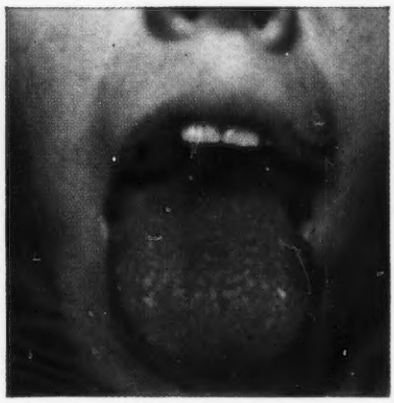

Plate 8.—A cobblestone or pebbled tongue due to enlarged but not reddened papillæ is sometimes useful in diagnosing riboflavin deficiency if confirmed by diet and other evidence.

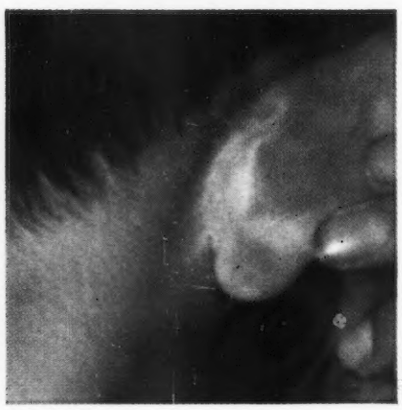

Plate 9.—Seborrhœic dermatitis behind the ear is so rare that it was not put with plates 4 and 5 showing commoner sites.

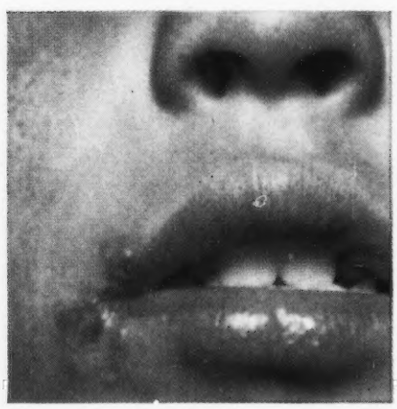

Plate 10.—Infection often becomes superimposed on acute angular stomatitis, and therapy with riboflavin, or with iron, depending on the cause, helps to clear the infection.

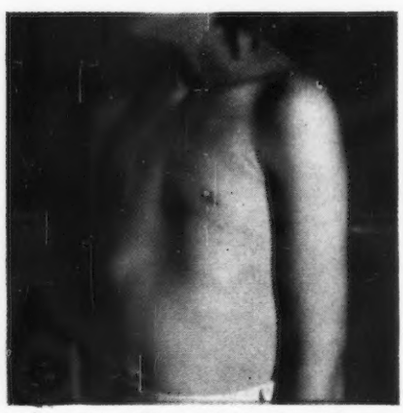

Plate 11.—Chest deformity of past rickets. Shows depressed sternum and also the flared ribs that give Harrison's sulcus.

Plate 12.—Chest deformity of past rickets. A pigeon breast is not often seen.

Plate 13.—Folliculosis, also called permanent goose flesh and other names; several different types are described. Occurs especially on the upper arms, and on thighs. Has a relationship to fat intake, and to vitamin A.

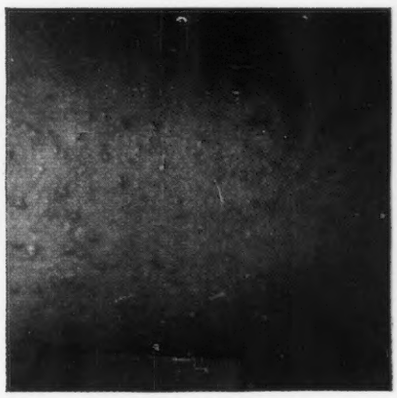

Plate 14.—Folliculosis and a perifolliculitis occurring together. May be mixed deficiency of vitamins A and C, but dietary, laboratory and other evidence is needed for a diagnosis.

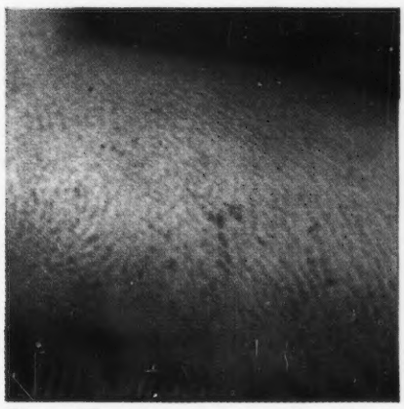

Plate 15.—Xerosis, or a dry skin is not easy to show in photographs, unless marked. It should be fairly generalized to associate with vitamin A deficiency.

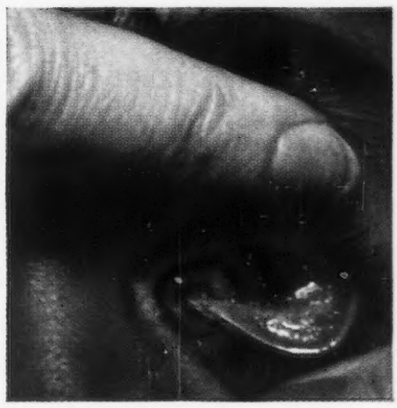

Plate 16.—Follicular conjunctivitis. The follicles should extend right across the palpebral conjunctiva. Often a good sign of vitamin A deficiency if confirmed by other evidence.

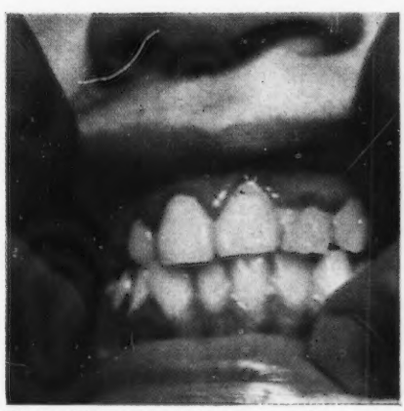

Plate 17.—Gums that are red but not swollen are not related to vitamin C deficiency in most cases.

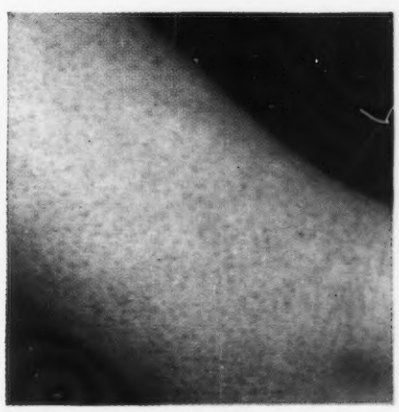

Plate 18.—Perifolliculitis. Erythema and congestion of various kinds occur around hair follicles; some of them are the perifollicular petechiæ of true scurvy, but all need confirmation as by therapy.

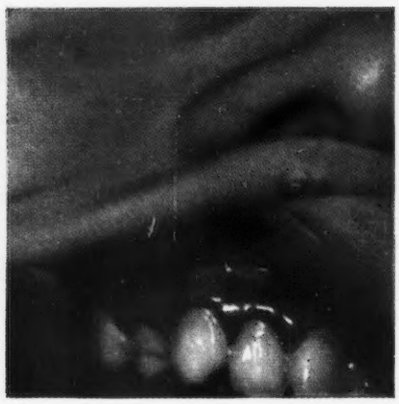

Plate 19.—Generalized gingivitis means red (or purple) swollen gums. Sometimes due to vitamin C deficiency, which may be confirmed by a finger prick sample of blood.

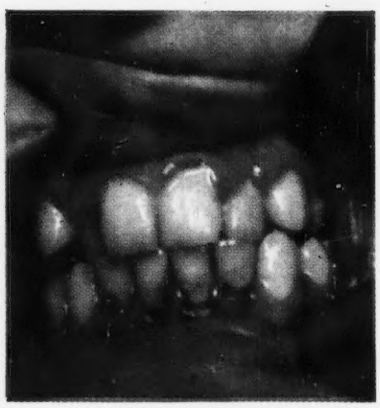

Plate 20.—Gums which are both red and swollen, may be related to vitamin C (ascorbic acid deficiency) in some cases, especially if also bleeding, and confirmed by diet and laboratory.

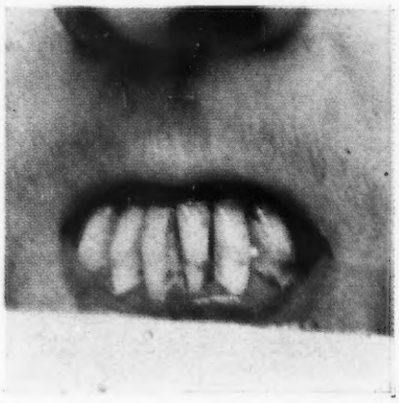

Plate 21.—Extreme recession of gingival tissue is sometimes considered to be evidence of chronic vitamin C deficiency, but this seems to be true only rarely.

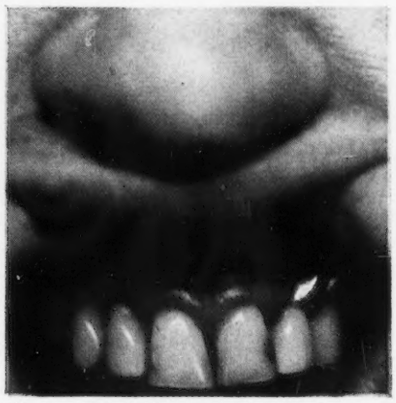

Plate 22.—Moderate recession of interdental papillæ may result from vitamin C deficiency but needs confirmation by dietary and laboratory results.

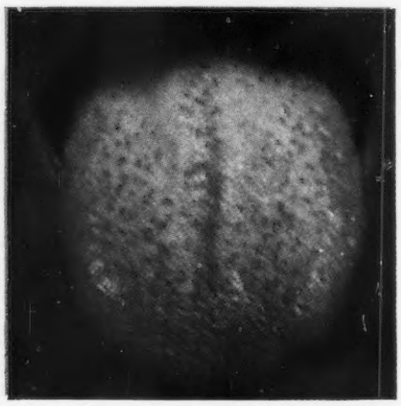

Plate 23.—Denuded filiform papillæ, enlarged and reddened, are sometimes indicative of niacin deficiency but this needs support from other evidence for a diagnosis.

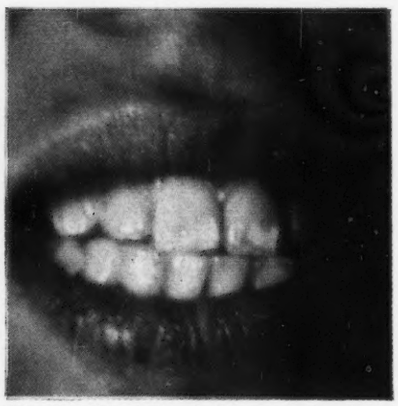

Plate 24.—Mottled enamel from fluorine in early childhood (fluorosis) may not be disfiguring and usually confers freedom from dental decay.

TABLE V.—*Continued.*

	Indian children				*Whites*									
Age and sex	*1 - 9*	*10 - 14*	*15 - 19*		*1 - 9*	*10 - 14*	*15 - 19*		*20 - 39*		*40 - 59*		*over 59*	
			M.	*F.*			*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*
Number	*226*	*524*	*37*	*37*	*2,368*	*1,769*	*160*	*202*	*123*	*243*	*128*	*178*	*30*	*32*
Criterion:—Two of the physical signs listed below, or one confirmed by a diet low in carotene or by a low serum level of vitamin A.														
(a) Folliculosis (color plates Nos. 13, 14)	8.0	12.0	5.4	21.6	11.9	15.2	13.1	8.4	4.1	2.5	0.8	1.1	0	0
(b) Xerosis (color plate No. 15)	14.2	6.7	0	5.4	1.5	1.8	2.5	0.5	0	1.6	0.8	1.7	0	9.4
(c) Follicular conjunctivitis (color plate No. 16)	0.9	1.0	5.4	2.7	6.6	4.2	2.5	1.0	0	1.2	0	0	0	0
6. Ascorbic acid deficiency. Definite	0	0	0	0	0	0	0	0	0	0	0	0	3.3	3.1
Criterion:—A diet low in citrus fruits, tomatoes, potatoes etc., *plus* a serum level less than 0.3 milligrams of ascorbic acid per 100 ml. serum, *plus* one of the physical signs listed below; *or* two physical signs, confirmed by either diet or serum level. Of those diagnosed, all had red, swollen, bleeding gums; about 4% had folliculitis.														
Probable	0	0	0	0	1.0	2.2	1.9	2.0	0.8	0	3.1	0.6	20.0	12.5
Criterion:—Any two physical signs listed below, or one sign confirmed by either a poor diet or by a low serum level of ascorbic acid, or a poor diet with a low serum level.														
(a) Gums red or purple and swollen (color plates Nos. 19, 20)	2.2	5.3	8.1	5.4	5.1	10.6	13.8	6.9	17.9	7.4	16.4	16.8	23.3	6.2
NOTE:—Gums red only (color plate No. 17)	9.7	16.2	18.9	21.6	7.2	13.8	20.6	15.8	33.3	25.1	34.4	30.3	43.3	18.8
(b) Gums bleeding	0	0	2.7	0	0.2	0.8	0	0.5	0.8	0	0.8	1.7	3.3	0
(c) Folliculitis (color plate No. 18)	0.4	0	0	2.7	0	0.4	0.6	1.5	0	0	0.8	1.1	0	0
7. Niacin deficiency. Definite	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Criterion:—Diet low in meat and whole grain cereals plus two of the physical signs listed below. Can be confirmed by a lack of fluorescing excretory products in the urine.														
Probable	0.4	0.2	0	0	0	0.1	0	0	0	0.8	0	0.6	0	0
Criterion:—Two of the following physical signs, or one sign confirmed by the diet or urine.														
(a) Hyperkeratosis knees or elbows	1.3	0	0	0	1.6	1.3	0	2.5	0	0.4	0	0	0	3.1
(b) Denuded lingual papillæ (color plate No. 23)	8.0	8.6	8.1	8.1	1.1	0.8	3.1	6.4	0	0.8	0 8	0	0	0
(c) Scarlet or smooth tongue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Protein deficiency—No definite or probable cases found.														
Possible	2.2	3.4	2.7	5.4	3.8	4.5	3.1	3.0	0	0.8	3.9	1.7	0	0
Criterion:—Total serum protein less than 6.0 grams per 100 ml.														
9. Mottled enamel (fluorosis) (color plate No. 24	11.1	15.5	13.5	10.8	0.6	0.7	8.8	5.4	2.4	0.8	0	1.1	0	0

found in normal people may make the report a "low normal" for most tests now available. The following are the most useful of such laboratory tests that are available in Canada through each Provincial Laboratory Service, as well as in some hospitals: hæmoglobin, total protein, serum vitamin A, carotene, ascorbic acid, serum alkaline phosphatase and blood pyruvate, as well as urinary excretions of B vitamins and ascorbic acid. A low value for serum vitamin A (*e.g.*, 20 micrograms per 100 ml. serum), may aid the diagnosis of the cause of a xerosis and a follicular conjunctivitis, even though it is a "low normal". Arrangements can be made by a Provincial Laboratory with the Department of National Health and Welfare for assistance in regard to such tests.

CLINICAL SIGNS

Table V lists for Indians and whites of various ages and sexes the frequency with which definite and probable diagnoses have been made

on certain Canadians, and the frequency of the various signs that have entered into these diagnoses. Not shown in the table are the dietary results and the laboratory results, both of which are used in arriving at a diagnosis.

From these results the reader can appreciate how seldom some of the single signs appear in an ordinary population group. It is also apparent that some of them appear many times more often than a corresponding diagnosis of malnutrition is made. Most of these unspecific signs are illustrated in the coloured plates. They are grouped under the appropriate possible diagnosis, but it must be emphasized that the diagnosis can not usually be made from one sign alone. Some signs, such as corneal vascularization and conjunctival thickening are not listed either because their relationship to nutrition is doubtful or because they require instruments, (such as a slit-lamp) that are not normally available to a practitioner.

DISCUSSION

Gone are the days when we could say that the presence of a particular vitamin in the diet prevents the corresponding deficiency disease, and conversely that the absence of the vitamin necessarily results in the development of that disease. Some of the complicating factors prevent the organism from absorbing or utilizing the vitamin when generously present, while others help the organism to adapt itself to greatly reduced supplies. Tissue changes resulting from former dietary inadequacies may persist indefinitely even when therapy and diet have become adequate. Some changes, such as rachitic chest deformities, may be irreversible, but they may or may not influence subsequent health. Rickets is also an example of a disease that depends not only on the vitamin D (which may exist in several forms) but also on the intake and balance of minerals, the acidogenic properties of the diet, and even on the presence of anti-calcifying factors. Many vitamins have "anti-vitamins" either occurring naturally or manufactured by bacteria that may become established in the intestinal tract. Intestinal bacteria may use up some of the ingested B vitamins, while others synthesize them. A high fat diet lessens the needs for thiamine, and a low fat diet may decrease the absorption of carotene or of vitamin A. The accumulation of metabolic products may be either an advantage or a disadvantage.

By some means a diagnosis must be made. Physical inspection alone may show the existence of one or more changed tissues, but the diagnosis is likely to be in error unless correlated tissue changes are noted and confirmed by dietary and laboratory information. Contrary results from diet history or laboratory should caution against too definite a diagnosis.

SUMMARY

1. Malnutrition can not be properly assessed from one sign alone, or from diet alone, or from laboratory tests alone. Even with all these approaches much information is still needed before a satisfactory system of assessment will be evolved. This paper lists some procedures and results on 6,000 Canadians as a preliminary orientation.

2. A dietary history is valuable as a basis for advising the patient on practical improvement, because there is still no substitute for a good diet of ordinary foods. The dietary history can also confirm or question the results of physical inspection and laboratory tests. Canada's Food Rules are given as a guide to an adequate diet pattern, and a table of foods and nutrients provides a basis for special advice.

3. Conditioned malnutrition in which clinical, functional or laboratory signs indicate the diagnosis *on a diet that seems fairly adequate*, is shown to be important in the Canadians studied. This does not mean that increased ingestion of foods or of special nutrients would benefit such people, since the conditioning causes as listed in Table III, need to be sought.

4. Useful laboratory tests which are available through every Provincial Laboratory, and some hospitals, are listed.

5. The prevalence of certain deficiencies, by age and sex, among 6,000 Canadians is recorded, along with the prevalence of single signs that are sometimes related to the diagnosis given. Many signs occurred much more frequently than finally diagnosed cases, thus emphasizing the unspecific nature of the signs, and the danger of a diagnosis.

6. The figures do not represent the incidence of malnutrition in Canada as a whole since they are derived from too few areas, which came to be studied in a non-random manner, and present other sources of bias.

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THE VALUE OF SPUTUM EXAMINATION IN DIAGNOSIS OF CANCER OF THE LUNG*

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IN the light of recent interest in the diagnosis of cancer by the microscopic examination of exfoliated cells, it was felt that a parallel study of sputum and bronchial secretions by cytological and histological techniques would be of interest. In spite of the fact that pneumonectomy is now a practical procedure, the 5 year survival rate in bronchogenic carcinoma remains depressingly low, largely because of late diagnosis. The importance of roentgenography in the diagnosis of bronchogenic carcinoma is well recognized. Bronchoscopy with biopsy, while a very valuable and accepted procedure, frequently fails to establish the diagnosis in peripheral lesions or tumours of upper lobe bronchi. Aspiration biopsy, although advocated by some,[2, 3, 7, 17] has failed to gain general acceptance in the diagnosis of cancer of the lung. The examination of pleural fluid for tumour cells or the histological examination of accessible lymph nodes does not lead to a positive diagnosis of bronchogenic carcinoma at the resectable stage. Recently there have been numerous reports indicating that the diagnosis of malignant disease of the lung is possible in an encouraging proportion of cases by the microscopic examination of sputum and bronchial secretions.

HISTORICAL REVIEW

As early as 1860 Beale observed large multinucleated cells singly and in clumps in untreated preparations of sputum from an advanced case of carcinoma of the pharynx. The first microscopic demonstration of malignant tumour cells in sputum from a case of pulmonary carcinoma was by Hampeln in 1887. Scattered reports of tumour fragments or tumour cells in sputum appeared, but the next important contribution in this field was by Dudgeon and Wrigley in 1935. They adopted the wet film technique which had been employed to advantage by Dudgeon and Patrick (1927) in the rapid microscopic diagnosis of tumours. Several further reports of the use of this technique followed, and in particular a monograph by Wandall in 1944.

However, other authors obtained variable results. Rumel and Shields Warren found malignant cells in the sputum of several proved cases of cancer in the series reported by Overholt (1940). But the method was of practical value in one case only since in the others the growths were advanced or biopsy had been positive. Craver (1940) made a diagnosis from examination of the sputum in only 2 of 175 cases of bronchogenic carcinoma, in each case by sectioning gross tissue fragments found in the sputum.

The present revival of interest in the examination of sputum and bronchial secretion for cancer cells, is due primarily to the work of Papanicolaou. He applied his smear technique to the study of sputum for the detection of tumour cells in 1946, and in the same year Herbut and Clerf studied bronchial secretions by the same method. Woolner and McDonald stained smears of sputum and bronchial secretions with hæmatoxylin and eosin.

In 1948 Mathews reported his results using paraffin sections of sputum fixed in Bouin's fluid, and stained with hæmatoxylin and eosin. Richardson *et al.* (1949) collected bronchial secretions or sputum which they fixed in formalin and picric acid and filtered. From the sediment they made paraffin sections which were stained by a modified Papanicolaou stain.

By these various methods, correctly positive results were obtained in from 68 to 89% of cases, whereas bronchoscopic biopsy was positive in from 44 to 68% (see Table I). The present report describes an attempt to compare objectively the cytological and histological methods in the examination of sputum or bronchial secretions for the recognition of tumour cells.

MATERIALS AND METHODS

Fresh samples of sputum were obtained from patients in the Royal Victoria Hospital. Bronchoscopically aspirated secretions, when not required for other diagnostic purposes, were collected fresh from patients undergoing bronchoscopy. In either case, specimens were obtained without prior knowledge of the clinical history.

Sputum specimens were poured into a Petri dish and examined against a black background. From the more solid or blood-streaked portions of the sputum 4 smears were prepared. These were fixed in equal parts of 95% alcohol and ether and stained by the Papanicolaou technique (EA 65). The remainder of the specimen (up to 3 c.c.) was rolled into one mass and poured carefully into Bouin's fluid. Fixation was for 24 hours, or, if the sputum was very mucinous, for 48 hours. The fixed sputum was wrapped in gauze, dehydrated in alcohol, cleared in toluol and embedded in paraffin. Four sections, at different levels in the block, were stained with hæmatoxylin and eosin, hæmalum and phloxin or Papanicolaou's stain (EA 65). Bronchial secretions were centrifuged and the sediment treated in the same way as sputum. If the material was scanty, smears only were made and stained by the Papanicolaou technique.

Slides were examined systematically with a mechanical stage and reported as positive, negative or suspicious. If the first specimen of sputum was negative, no further

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specimens were requested, but if it was considered suspicious, further material was sought until a definite conclusion was reached. Positive results were confirmed by additional sputum or bronchial secretions when possible.

Specimens were obtained from 110 patients, of which 20 were proved or probable cases of cancer of the lung, and 90 were cases of benign pulmonary disease. This latter group consisted of 40 cases of chronic pulmonary disease, 21 cases of acute pulmonary disease, 11 cases of cardiac disease with pulmonary complications, and 18 miscellaneous cases, 5 of which were cases of extrapulmonary neoplasm.

CRITERIA OF MALIGNANCY

This is one of the more controversial aspects of exfoliative cytology, as a method of diagnosis of malignant neoplasms. It is generally accepted that benign or malignant cells are shed from epithelial surfaces, but there is considerable difference of opinion as to whether or not cancer cells, singly or in small groups, can be recognized as such.

Microscopic fragments of tumour present no real problem since these may be evaluated by accepted histological criteria. It is in the interpretation of cells, observed singly or in small clusters that difficulty arises. Since MacCarty in 1929 stated that individual tumour cells could be positively identified by the diametric ratio of nucleolus to nucleus, numerous workers have attempted to find absolute criteria of malignant cells. However, such morphological criteria have not been found and points of distinction between the cells of malignant tumours and benign lesions have been relative differences requiring interpretation. Hauptman recently studied stained smears of carcinomas and non-cancerous control tissues. He found 5 types of cytological picture in carcinoma including 8 characteristic cell types, but he was unable to find any common denominator in these various cell types. However, it is evident from the high percentage of correctly positive reports and the negligible number of falsely positive interpretations, that experienced observers can develop useful, accurate cytological criteria.

The characteristics of exfoliated cancer cells that have been found to be of greatest diagnostic value are chiefly nuclear. These include great variability in the size, shape and chromatin pattern of the nuclei of cancer cells. Large or multiple nucleoli may be present, the chromatin may be clumped into coarse granules or the nucleus may be uniformly hyperchromatic. Nuclear giantism either absolute

TABLE I.

CYTOLOGICAL DIAGNOSIS OF BRONCHOGENIC CARCINOMA

Observers	*Total cases*	*No. of cases with cancer*	*Correctly positive report*	*No. of cases without cancer*	*False positives*	*Bronchoscopic biopsy positive*	*Remarks*
Dudgeon and Wrigley, 1935	58	38*	26 (68%)	20	1	....	*At least 2 were metastatic.
Wandall, 1944	250	100 (75) (20 metast.) (8 larynx etc.)	84 (84%)	122	6	49%	In 193 cases no knowledge of clinical findings.
Gibbon, Clerf, Herbut and Detuerk, 1948	?	118	105 (89%)	?	?	44%	
Mathews, 1948	88	33†	24 (72%)	55	?	....	†Pathologically proved or reasonably certain clinical and radiological diagnosis.
McKay, Ware, Atwood and Harken, 1948	170	54 (48)	40 (74%)	116	3	54%	
Woolner and McDonald, 1949	200	190 (121) (4 larynx etc.)	194	?	4 (2?)	.....	These 200 cases all had positive smears.
Richardson, Hunter, Conklin and Petersen, 1949	48	19 (19)	17 (89%)	29	0	69%	Procedures standardized.

Note:—The figures in parenthesis in the second column represent the number of cases in which there was histological proof of tumour.

or in relation to cell size is of considerable diagnostic significance in the recognition of detached cancer cells.

The characteristics of the cells themselves is less important, but may be helpful. In pleomorphic tumours, giant cells, either mononuclear or multinuclear, may be seen, (see Fig. 4) and there may be great variation in cell size and shape.

The Cytology of Sputum and Bronchial Secretions

The various types of innocent cells that occur in sputum and bronchial secretions have been described in detail by previous workers in this field.[5, 10, 13, 18]

Squamous cells are frequently numerous in sputum and usually present no problem. Atypical squamous cells were observed in two cases. In a case of inoperable carcinoma of the breast the sputum contained superficial squamous cells with unusually large nuclei. These were considered suspicious but were probably due to irradiation. In the second case there were squamous cells of intermediate size with nuclei which were larger than normal or pyknotic, and the cytoplasm had a marked affinity for orange G. The final diagnosis is not yet known in this case.

Respiratory epithelial cells, often ciliated, are readily recognized as such. Similarly, red blood cells, neutrophiles, eosinophils, lymphocytes or plasma cells present no difficulty. Pulmonary macrophages, often containing carbon or iron pigment, are usually easily identified. However, in two cases unusual macrophages were confusing. In one case clusters of macrophages were considered suspicious, but autopsy revealed only bronchopneumonia with multiple abscesses and pulmonary infarcts. Similar cell clusters filled the alveoli in the pneumonic areas. In the second case clusters of vacuolated macrophages with enlarged nuclei suggested the diagnosis of adenocarcinoma. Autopsy revealed only resolving pneumonia.

Epithelioid cells and occasional Langhans giant cells were seen in cases of tuberculosis. Cells slightly larger than lymphocytes with more abundant cytoplasm and larger more vesicular nuclei were suspect for a time until similar cells were found in non-cancerous lymph nodes. These cells were also considered to be lymphoid.

Neoplastic Cells

The cytological criteria for recognition or identification of the cells of malignant tumours in sputum and bronchial secretions have been described above. The importance of anisocytosis, anisonucleosis, nuclear hyperchromatism, nuclear size, and nuclear cytoplasmic ratio has been emphasized.

In addition to these general criteria, more particular criteria related to tumour type have been described. Perhaps the chief advantage of the Papanicolaou stain is to render more prominent cornifying cells shed from squamous

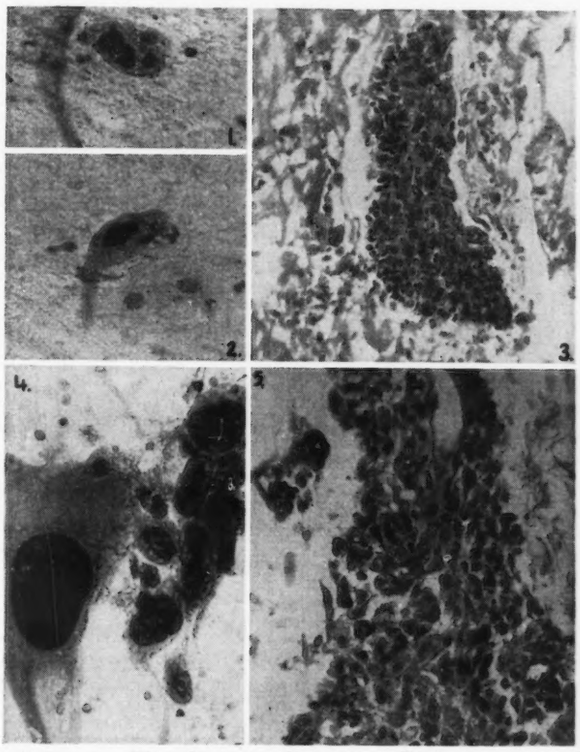

Fig. 1.—Binucleate malignant cell from case of squamous cell carcinoma of the bronchus, in which the diagnosis was first made from a paraffin section of bronchial secretion (see Fig. 3). Smear of sputum EA 65. 600x. **Fig. 2.**—Malignant cell from the same case as Fig. 1. The nuclei of 2 poorly preserved superficial squamous cells are also evident. Smear of sputum EA 65. 600x. **Fig. 3.**—Fragment of tumour in bronchial secretion from the same case as Figs. 1 and 2. Section of bronchial secretion EA 65. 225x. **Fig. 4.**—Cluster of malignant cells including a tumour giant cell in a case of undifferentiated carcinoma of the bronchus. Smear of sputum EA 65. 600x. **Fig. 5.**—Fragment of tumour from the same case as Fig. 4. Section of sputum. Hæmalum and phloxin. 225x.

cell carcinomas. In this type of tumour, cells of many bizarre shapes may be met with (see Figs. 1 and 2) including the bird's eye cells described by Wandall. Pleomorphic tumours may shed cells which are so unusual that the diagnosis of malignancy may be made with

great confidence (Figs. 4 and 5). In adenocarcinomas cytoplasmic vacuolation may be evident but the diagnosis of malignancy must be based on nuclear characteristics. The cells from oat-cell carcinomas are small but the nuclei are relatively large and hyperchromatic with coarsely granular chromatin. These cells tend to occur in streaks in the smears.

In the last analysis the criteria of malignancy are empirical rather than absolute.

RESULTS

The interpretation of results is based on the examination of 178 specimens from 110 patients. In all, 145 specimens of sputum were examined, 143 by smears and 130 by paraffin sections. Bronchial secretions were examined by smears in 33 cases and by paraffin section as well in 16. There were 20 cases of proved or probable cancer of the lung, and 90 cases with benign pulmonary disease.

In the 20 cases of proved or probable cancer of the lung histological proof of the existence of cancer was available in 12. Of these latter one was proved to be a case of metastatic cancer of the lung, and another was a case of cancer possibly metastatic in the lung. Of the remaining 10 cases of primary carcinoma of the lung, 3 were proved by autopsy, 4 by pneumonectomy, and 3 by bronchoscopic biopsy. In 2 cases the diagnosis of cancer of the lung was confirmed by thoracotomy without the final proof of biopsy, and in 6 cases the diagnosis of bronchogenic carcinoma was made on good x-ray and clinical evidence.

In this group of 20 cases examination of the sputum or bronchial secretions was positive in 17, suspicious in 1 and negative in 2. In one of the cases interpreted as negative a single smear of sputum and in the other a single smear of bronchial secretion only, was examined. In the case reported as suspicious, one specimen of bronchial secretions was examined. Atypical cells were present in the smear and similar "oat cells" were later observed in smears made directly from the tumour, so that in retrospect this is considered an error in interpretation rather than a defect of the method. The material examined by paraffin section, in this case consisted of blood only. In 17 cases (85%) examination of sputum or bronchial secretions was positive.

The analysis of results in the 20 cases is tabulated by cases in Table II. In the case of sputum, smears were obtained in 17 patients and were positive in 16 (94%). Sections of sputum from 16 patients were positive in 13 (81%). Smears of bronchial secretions in 9 patients were positive in 3 (33%) and sections of bronchial secretions, available in 6 cases, were positive in 3 (50%).

TABLE II.
ANALYSIS BY CASES

	Sputum		*Bronchial secretions*	
Report	*Smear*	*Section*	*Smear*	*Section*
Positive...	16 (94%)	13 (81%)	3 (33%)	3 (50%)
Suspected.	–	2	3	–
Negative..	1	1	3	3
	17	16	9	6

The analysis of results by specimens is tabulated in Table III. Of 41 specimens of sputum examined by smears 31 (75%) were positive. Of 38 specimens of sputum examined by paraffin section 23 (60%) were positive. In the case of bronchial secretions the percentage accuracy for smears is lowered to 30% and that for sections remains unchanged at 50%.

TABLE III.
ANALYSIS BY SPECIMENS

	Sputum		*Bronchial secretions*	
Report	*Smear*	*Section*	*Smear*	*Section*
Positive...	31 (75%)	23 (60%)	3 (30%)	3 (50%)
Suspected.	4	5	3	–
Negative..	6	10	4	3
	41	38	10	6

In the 90 cases apparently free from cancer of the lung, there was one case falsely reported as positive by sputum smear and interpreted as negative on sputum section. Autopsy revealed only unresolved pneumonia, and the misleading cells were subsequently identified as vacuolated macrophages.

DISCUSSION

Although the number of cases is too small for any conclusions, perhaps a few impressions are justifiable. Malignant tumour cells can be recognized in smears or sections of sputum or bronchial secretions in a considerable proportion of cases of pulmonary cancer. In two of the cases in which pneumonectomy was performed (Figs. 1, 2, 3), sputum examination was the first indi-

cation of the presence of bronchogenic carcinoma, and in another of the cases with a resectable tumour (Figs. 4, 5), it supplied the only preoperative microscopic evidence of carcinoma. Although in some cases cancer cells are readily recognized, in others this decision is difficult and requires experience, as is illustrated in the case previously mentioned where typical "oat-cells" in bronchial secretions were not recognized as such.

In the case of sputum the yield of positive diagnoses was somewhat higher from smears than from sections. In no patient was the smear negative and the sectioned material positive, but this did occur in individual specimens on two occasions, and in one case (Fig. 3) a section of bronchial secretions provided the first evidence of the presence of tumour. However, it should be emphasized that material for smears was selected first from any given specimen. Moreover, a standard technique for smears was applied from the beginning, whereas in the preparation of sections the technique was modified by experience. The only proved false positive occurred in a smear and the corresponding section was correctly read negative. In the case of smears of sputum from patients without pulmonary tumours, suspicious reports occurred distinctly more frequently than with sections of the same material. The greatest advantage of sections as opposed to smears is that they quite frequently include tissue fragments sufficient to permit a histological diagnosis (Figs. 3, 5). In other cases smaller aggregates, while not actually large enough to make histological diagnosis, provided strong evidence of the presence of tumour. Finally it is of considerable importance that the examination of 4 smears requires 4 to 5 times as long as the examination of 4 sections, and hence is much more time-consuming.

In the 20 proved or probable cases of carcinoma of the lung, bronchoscopic biopsy was carried out in 11 and was positive in 6 (54%). Among the 5 cases in which bronchoscopic biopsy failed to demonstrate the tumour, sputum examination was positive in 3 and the bronchial secretions were reported as suspicious in 1. The examination of sputum and bronchial secretions is a procedure which supplements bronchoscopic biopsy, and smears and sections of these materials complement each other.

SUMMARY

A total of 178 specimens of sputum and bronchial secretions from 110 patients were examined microscopically, without prior knowledge of the clinical history. This included 145 specimens of sputum, 143 of which were examined by smears and 130 by paraffin sections, and 33 bronchial secretions, all of which were examined by the smear technique, and 16 by paraffin sections as well.

Positive results were obtained in 17 of 20 proved or probable cases of cancer of the lung. In 90 cases apparently without pulmonary tumour one false positive report was made.

In the case of sputum, the smear technique gave a slightly higher yield of positive results than paraffin sections, but it is felt that there are advantages to both methods and that they complement each other.

I wish to express my appreciation to Dr. G. Lyman Duff for his interest and helpful criticism in the preparation of this paper.

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A conspicuous and significant trend discernible in a number of areas throughout the country today is the development of programs to decentralize medical education and to bring to outlying and remote areas the up-to-date knowledge and skills of the medical centre. . . . There is a more effective method of postgraduate education which at the same time strengthens the graduate training and brings with it direct improvement of medical care. I refer to the system in which a pædiatric resident from a teaching hospital rotates through periods of service in suitably qualified outlying hospitals which become affiliated with the teaching centre.—John P. Hubbard, *The Diplomate*, **22**: 179, 1950.

MELANOTIC SARCOMA

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MELANOTIC sarcoma is a comparatively rare disease. It accounted for 0.35% of all admissions to the Toronto General Hospital in the years 1934 to 1948. Peller, quoted by Willis,[11] states that it forms about 4% of skin and lip carcinoma. We are accustomed to think of the disease as very lethal, not realizing, or, perhaps, forgetting, that the high mortality rate has been partly due to inadequate therapy.

The records of 106 patients were studied and the results form the basis of this paper.

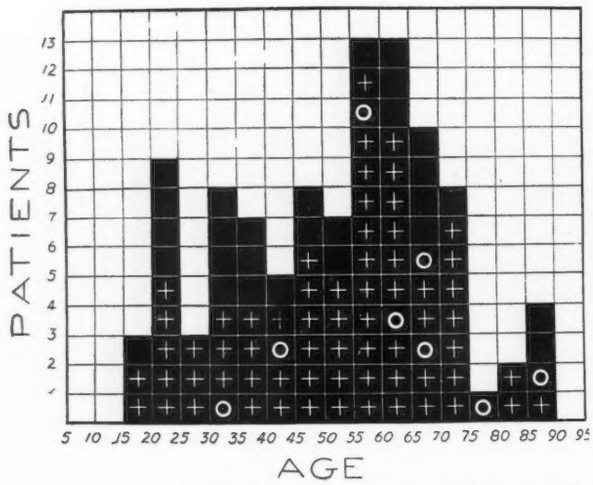

Fig. 1.—Graph illustrating the age distribution in our series. The crosses indicate those dead of their disease, the zeros those dead of some other disease.

Webster *et al.*[10] found the disease occurred slightly oftener in females (57% of 155 cases). Fifty-nine of our patients were males. Willis[11] believes the incidence is about equal in the sexes. The disease may develop at any age but is commonest between 35 and 75. Our youngest patient was 15, the oldest 88.

The distribution of the primary growths in this series agrees fairly well with the published reports of others.[2, 3, 10] There were 22 instances of the sarcoma developing in the head and neck, 19 in the eye, 8 on the upper limb, 23 on the trunk, and 34 on the lower limb. The infrequent appearance of the disease on the hands, noted in our series (2), is an old observations. Also observed was the infrequent development of the lesion in normally pigmented skin, *e.g.*, areola, vulva, etc.

Willis[11] states definitely that, with few exceptions, the lesion arises in a pre-existing mole. Dawson[4] says that while "benign nævi of various types develop apparently spontaneously in adult life . . . probably . . . a minute faintly-pigmented spot has been present since birth". A definite story of a pre-existing mole was noted in 52 of our cases; Webster *et al.*[10] report a previous lesion in 65%, and Affleck[2] in 84% (266 of 317). It would seem reasonable to assume that a melanotic sarcoma usually, if not always, arises in a mole or melanoma.

The commonest factor responsible for the change from melanoma to melanotic sarcoma would appear to be trauma.[1 to 11] Injury ranges from pulling hairs from a melanoma, as happened in one of our cases, through irritation, actual blow or crush, to inadequate treatment. The importance of this fact is something that is of the utmost interest to those groups providing compensation for injury and illness.

Early spread of the disease is by lymphatic channels. This has been noted by many, first apparently by Handley.[5, 6] Lymphatic spread was present in 58 of our patients before any evidence of widespread metastases. The distinct impression was formed that vascular spread, with resultant visceral metastases, was a late phenomenon. This agrees with the observations of Handley.[6] Once blood stream invasion occurs any organ may be affected. Even a fetus *in utero* may be seeded.[9]

The commonest complaint reported is increased growth of the original lesion. This was noted in 41 of our patients. Bleeding and ulceration are next in order of frequency, and each was the presenting symptom in 12. Pain was the first complaint in 3 cases; local irritation and darkening twice. Rarely the patient complains of a thin discharge having a foul odour. It should be understood that the development of such changes does not always mean that malignancy is present, but their presence demands immediate and adequate treatment. Two patients came because of the presence of secondaries, never having noticed their primary lesion. Melanuria, when present, is a late development, and is not pathognomonic since it can occur in other diseases.[4]

Treatment may be preventive or definitive. Definitive treatment may be by radiation, cauterization, or excision.

Preventive treatment consists in the prophylactic excision of melanomata. Since, as has been shown,[10] the average person has at least 20,

it is ridiculous to advocate the surgical removal of all melanomata. However, the surgical excision of melanomata, together with surrounding skin, situated in sites rendering them liable to chronic irritation is a feasible procedure. Herein, according to Adair,[1] lies our chief hope of improving our percentage of cures. A second definite indication for the excision of a melanoma is the presence of any deviation from its norm.

Melanotic sarcomata are not sensitive to radiation therapy.[1, 2, 3, 7, 10, 11] Adair[1] states only 2.5% showed any evidence of favourable response. It is therefore not the treatment of choice.

Cauterization in any form is only mentioned to be condemned.[1, 2, 3, 7, 10, 11] It often has been the injury that initiated malignant change. Its use also precludes the making of a definite diagnosis by histological means.

Fig. 2.—Microphotograph of histological section of lesion excised 3 months after cauterization of a melanotic sarcoma. Groups of malignant cells are still present in the dermis.

Complete excision is the only treatment of real value. Handley,[6] many years ago, laid down certain criteria for proper excision. Thus he advocated the wide excision of skin about the lesion (2″), a circle of deep fascia below the primary, an area of muscle below the primary, a band of deep fascia carrying trunk lymphatics from the primary to the nearest nodes, the nodes above the lesion with their surrounding fascia, and the set of nodes immediately above these. All this was to be excised in one block. This is not always feasible, but still remains the objective in the surgical treatment of the disease. It is not, for instance, feasible when the lesion occurs on a finger or toe. Pack[8] has suggested, in these cases, the wide excision of the primary. Ten days to two weeks later the regional nodes are removed if it is believed that the nodes are involved; if not dissection may be delayed up to six weeks. It is hoped by this means to eliminate any emboli liberated in the lymphatic channels. Dissection of the regional nodes should be done whether or not any enlargement is present.[7, 8] McCune[7] has pointed out that if such dissection is carried out before nodes are the seat of secondaries the patient has a much better chance of survival. Involvement of bone is an indication for amputation.

Of our 106 cases, 54 are known, and 13 are presumed, to be dead of their disease; 8 are known to be dead of some other disease; 14 are known to be alive, at least 2 with disease still present; 28 died in less than a year, 9 in less than 2 years, and 5 in less than 3 years.

Twelve were alive without evidence of disease as shown below:

Less than one year	3
Less than two years	1
Less than three years	3
Less than five years	3
Less than five and a half years	1
Less than nine years	1

One patient was alive and well two years following cervical block dissection. One of the patients alive three years was operated upon at the age of 16 for a melanotic sarcoma low on her thigh. The operation outlined by Handley was done. The patient alive nine years after operation is a very interesting one. She developed a melanotic sarcoma of the ependyma in the region of the right Gasserian ganglion which was removed in 1942. Three years later she developed signs and symptoms indicating an intracranial recurrence. This was treated radiologically. Complete disappearance of all signs and symptoms followed and, when seen in 1949, she appeared free of disease and was working full time.

One patient died of a stroke 17 years after developing a melanotic sarcoma of her thenar eminence. The original lesion was excised in 1932 and an axillary block dissection was done in 1934. In October, 1945, a local recurrence was removed from her thenar eminence. She died in October, 1949, and it was noted, "the hand lesion controlled". This patient also received radiation therapy.

An attempt was made to determine the effect of early treatment on the progress of the disease but no definite pattern could be made out. We must therefore, on the data available, agree

with Willis[11] that the course of the disease is quite unpredictable.

Melanotic sarcoma is a relatively rare, highly malignant lesion which arises in a pre-existent benign pigmented lesion. Its clinical course is quite erratic. Early spread is by way of the neighbouring lymphatic channels. Vascular spread is a late occurrence. Preventive treatment consists in careful surgical excision of melanomata occupying such sites as favour frequent irritation of the lesions, or which change in any way from their norm. Definitive treatment includes wide and deep excision of the primary lesion and its lymphatic fascial area together with the neighbouring nodes. Where possible, this should be done in one piece; where not, the primary lesion should be widely removed, and later a block dissection of the nodes receiving lymph from the involved area should be done.

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SOME ASPECTS OF SURGERY OF THE STOMACH*

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IN this paper it is intended that emphasis be placed on certain aspects of the common gastric problems as seen in the light of a recent review of a personal series of operative cases, covering the twelve year period from 1937 to April, 1949. The first part of the paper deals with malignant lesions of the stomach; the second section has to do with gastric and duodenal ulcers.

* A paper delivered in slightly abridged form before the Ontario Medical Association, May 24, 1949.

PART I.

Gastric operations were performed in 74 persons for malignant disease. Nine of these appeared to be examples of invasion of the stomach by growths originating in adjacent organs (œsophagus, pancreas, colon, etc.), and these have not been considered. The primary neoplasm was proved to be in the stomach in the remaining 65 patients. Certain data concerning this group are summarized in Table I in which a rather loose type of clinical classification is adopted with a view to the type of operative approach indicated. A transthoracic attack is desirable if not obligatory in those lesions limited to the cardiac area, especially where there is any extension to the lower œsophagus. The same route, or a combined abdomino-thoracic operation, was used with advantage in some of the advanced cases with widespread involvement of the upper stomach, or of the entire organ. Apart from such special indications, the abdominal route was employed routinely.

TABLE I.

PRIMARY GASTRIC MALIGNANCIES—65 OPERATIVE CASES

Age Range: 28 to 83 (over 65 years—35 or 56%).
Sex Incidence: Male : Female—39 : 25.
Tumour Mass Palpable from Without in 31 (48%).

Primary lesion	*Cases*	*Percentage*
Cardiac area (chiefly)	8	12.5
Localized in pylorus or body	15	21.5
Extensive	43	66.0
Metastases found		
Lymph glands	41	63.1
Liver	12	18.5
Other structures	Occas.	

The clinical symptoms occurring in this group, and leading to investigation, included every conceivable complaint which might be related to the upper abdomen, or to the constitutional effects of nutritional disorders. Symptoms of a proved or suspected "peptic ulcer" were noted in a surprisingly large number (16 or 24.6%). Occasionally the clinical picture was vague and obscure, but in many instances a reviewer is at a loss to account for the tragic delay that occurred so commonly before adequate investigation was carried out. Most modern writers on this subject deplore the lateness of effective management. Analyzing a large series of cases, Gates[1] found an average loss of six months before patients presented themselves for medical care, and he noted that an additional six months elapsed as a rule be-

fore a correct diagnosis had been established. My findings are not quite as grim as this, but they leave much to be desired. The need for education of the public is obvious. As a profession, we are just as greatly in need of a far greater measure of gastric consciousness, and a constant search for early and removable gastric carcinomas, in an effort to save some of the 40,000 victims of this dread scourge who succumb annually on this continent.

Diagnosis is rarely difficult in the late cases generally encountered, but in the early and hopeful stage of these lesions investigation must be well ordered, thorough, and at times repeated after a short interval. Assessment should take account of data obtained by all available methods, including a complete history and physical examination, meticulous x-ray study by an expert radiologist, laboratory tests comprising acid studies and stool examination for occult blood, and perhaps cytological scrutiny of the gastric contents for malignant cells. Other special methods are available for special cases. Every case of uncertainty should be reviewed by an alert internist, the clinical appraisal being essential to correct interpretation of the various findings; the treatment chosen is then directed at the disease, not simply at suppression of symptoms.

In the small series of cases presented here the principle of treatment was to attempt radical resection, irrespective of age and condition of the patient, provided that any reasonable hope of success existed. No consideration has been given to those in whom widespread metastases rendered any operative intervention manifestly fruitless in advance, or where operation was refused, or where grave co-existing organic disease seemed to offer an absolute contraindication. The age of most of these patients, together with gross malnutrition in the majority, and marked anæmia, and various deficiency states, has called for a program of intense preparation for the operative attack. Every effort has been made to restore the nutritional balance and make up the depletion of proteins, vitamins, electrolytes, calories and fluids. Special needs have been individualized for each case. Usually the stomach is cleaned up by repeated gastric lavages. In some cases oral hygiene has been restored considerably. Parenteral fluids, including repeated blood transfusions, have been of great service at all stages. It has seemed very worth while to encourage active exercises and walking wherever possible, for such patients appear much better able to tolerate difficult and sometimes prolonged operations.

Operation was undertaken only when the patient's condition appeared to warrant it. An experienced and capable anæsthetist has played a vital rôle in the actual handling of these procedures. Extensive dissections in the upper abdomen, at times with the left chest widely open, have necessitated close and careful control of the anæsthetic and oxygen requirements. Blood transfusion during the operation, sometimes to the extent of several litres, has proved of inestimable value. The magnitude of some of these sessions may be guessed by those who are not surgeons, when it is appreciated that in several instances removal has included the entire stomach, the spleen, the tail of pancreas, perhaps a good segment of the lower œsophagus, and even a portion of colon. It is neither possible nor desirable, within the limits of this paper, to set forth any of the technical problems or details involved.

The operative procedures carried out in this series are summarized in Table II.

TABLE II.

OPERATIONS FOR CARCINOMA OF STOMACH

	Cases	*Percentage*
Exploration alone	11	17.0
Palliative procedures	15	23.0
Resection (rad. subtotal or total)	39	60.0

In the main no elaboration is needed regarding these operations. Many cases listed as mere explorations were abandoned only after a determined attempt at removal had demonstrated the utter impossibility of such. Palliative procedures covered trial of several different methods. In a number of quite unresectable lesions of the pyloric portion of the stomach, the organ was transected high up, with the aid of the von Petz sewing clamp; an exclusion of the distal portion was effected, the proximal segment being anastomosed to the jejunum exactly as in the case of a partial gastrectomy with Hofmeister-Finsterer type of anastomosis. It may be noted that this method proved remarkably satisfactory in some cases, giving far more comfort than a simple gastro-enterostomy, and in one case being followed by reasonable comfort for eighteen months (judged a remark-

able survival for a very advanced growth, but of relatively low grade malignancy). One case returned two months postoperatively, after the above exclusion operation, with a gastric perforation, which proved fatal. Obviously the closed segment had become obstructed and an outlet should have been provided. Simple gastrostomy or jejunostomy was done in occasional early cases. My conclusions tend to confirm the view of Cooper and Buxton,[2] who condemn gastrostomy for an incurable gastric condition on the grounds that it neither prolongs life significantly nor provides noteworthy nutritional improvement. In some such cases it has seemed to us that the patient was saddled with one more unpleasant problem requiring attention.

Most of the resections have been very radical, being carried as wide of the lesion as possible, with removal of the lymphatic field as fully as possible, and the great omentum, etc. Gastrointestinal continuity has been restored in a variety of ways (Billroth I and Billroth II methods, œsophago-gastrostomy, œsophago-jejunostomy, etc.).

Postoperative management has been extremely important. The same principles have prevailed as in the preoperative phase. Fluid and nutritional needs have received close daily attention. Early activity has been encouraged, with its attendant benefits to all systems of the body, where feasible. Antibiotics have been used routinely in the resection cases. Gastric suction is continued for a variable period of time. Every effort is made to prevent complications and promote full rehabilitation. In this group of 39 major resections the hospital mortality was 9 or 23.0%. This figure parallels closely that for most of the large clinics, *e.g.*, in the Minnesota Hospitals, 15.2% for subtotal resection (State[3]).

Most of these cases are too recent to permit any attempt at a long term follow up. One man 68 years of age was resected in 1942, in the face of an enormous lesion of the distal half of the stomach, obvious to the palpating hand, labelled "inoperable" by a most competent radiologist, and with involvement of many of the lymph glands adjoining the stomach. When last seen seven years later this man was in fair health. Another man of 71, whose grade III anaplastic carcinoma of the pyloric region was removed in 1939, died of pneumonia 3 years later; necropsy revealed no evidence of residual neoplastic disease. Cases such as these help to compensate for many disappointments in this sort of surgery. Quite a number of the resections can be but palliative at best, and these have seemed to me to offer reasonable comfort for a matter of months, with somewhat less misery during the terminal stages. I feel convinced that the majority of palliative resections derive sufficient benefit from the intervention to justify our seemingly disproportionate endeavours. The pathological findings listed in Table III, considered alongside the grim facts in Table I, indicate further the reason for the high mortality in these cases (greatest before the end of the first year). The greatest ray of hope for me personally in recent times has centered in the lesions of the upper half of the stomach, commonly of low-grade malignancy, prone to remain localized for longer periods of time than lesions of the lower stomach, and lending themselves to transthoracic extirpation. Unfortunately, this group is pitifully small. During the last week I have examined three patients, all subjected to very extensive resections of this type some 8 months ago, and all progressing well.

TABLE III.

PATHOLOGICAL GRADING OF GASTRIC CARCINOMA IN 30 CASES

Grade	*Cases*	*Percentage*
I.	5	16.7
II.	6	20.0
III.	12	40.0
IV.	7	23.3

The very best of the published statistics quote survival rates for gastric carcinoma at the end of 5 years as from 5 to 20% (Welch and Allen[4] 7%; State,[3] for Wangensteen and his group, 6.6%).

I should like to close this section by stressing certain facts concerning gastric malignancy. Cancer ranks second only to cardiac disease as a cause of death. It is reliably estimated that from 25 to 40% of all cancer deaths in North America are due to gastric cases, and the figure seems to be rising with the increasing age of our population. Autopsy statistics indicate a rapid increase of deaths from this cause with each decade above the age of 20, to a figure of 8.8% of all deaths in men of 50 to 70, (Wangensteen[5]).

After symptoms make their appearance, precious time is lost to the extent that the majority of cases are absolutely hopeless when diagnosed. Our suspicions should be aroused at the slightest sign of functional disturbance of the gastro-intestinal tract, or of symptoms bearing any possible relation thereto, and the best available diagnostic facilities should be turned on the problem immediately. It is fatal to wait and see. We must adopt an aggressive and militant attitude. Every single gastric cancer is confined to the stomach for a longer or shorter period of time during which it is curable. Surgical excision constitutes the only known means of cure. It can be carried out effectively only where the lesion is detected early and then given the benefits of modern surgery. Owing to the many safety factors at our disposal today, major operations no longer carry a prohibitive risk. Properly performed, before the disease has run wild, such offer a real hope of cure and comfort to sufferers from a malady that, left unimpeded, proves 100% fatal, while being attended by untold suffering. No matter how valiant the firemen, and how diligent be their efforts, the building that is all ablaze cannot be saved as a useful entirety. Even so with the whole cancer problem, heroic and mutilating operations are poor substitutes for early detection and prompt resort to sound surgical treatment in patients who have been spared such complicating problems as serious constitutional deterioration, and complex deficiency states.

PART II.—GASTRIC AND DUODENAL ULCER CASES

For descriptive purposes it is customary to group these two types of ulcer together under the designation "peptic ulcers". It must be borne in mind that they are distinct entities with well-known points of difference. The remarks that follow are based upon observations in the personally treated operative cases briefly set out in Table IV, with occurrence of the various types of ulcer as listed.

TABLE IV.

ANALYSIS OF PEPTIC ULCER CASES—152 PATIENTS (174 OPERATIONS)

	Cases
Duodenal ulcer	110
Gastric ulcer	30
Duodenal and gastric ulcer	6
Stomal ulcer	12

The sex ratio was approximately 4 to 1 in favour of the male sex, and the ages at the time of operation range from 17 to 80.

It has long been recognized that the majority of peptic ulcers can be healed by careful medical therapy. The catch comes with recurrence of ulceration (or formation of fresh ulcers) in a vast proportion of the patients after a variable period. In this group of cases surgical measures were adopted only because of specific indications, notably the complications indicated in Table V, or after careful evaluation of the entire clinical problem.

TABLE V.

THE INDICATIONS FOR OPERATION IN PEPTIC ULCER CASES

1. Perforation.
2. Obstruction (cicatricial as opposed to reactive).
3. Hæmorrhage (especially exsanguinating or repeated).
4. Intractable pain.
5. Penetration into any neighbouring structure.
6. Suspicion of malignancy.

RELATIVE FACTORS INFLUENCING THE DECISION

1. Length of history.
2. Severity and persistence of symptoms.
3. Change in character of symptoms.
4. History of complications in the past, *e.g.*, perforation.
5. Excessive gastric acidity.
6. Social and economic status.

The different operative procedures undertaken in this series are noted in Table VI. In elective cases the aim was essentially to remove the ulcer-bearing area of mucous membrane, to break the acid-secreting mechanism as completely and certainly as possible, and to promote gastric emptying. Partial gastrectomy appeared to be the first choice, with vagotomy requiring consideration in recent years, and resort to procedures of less magnitude (and less promise) only where special considerations seemed to make this mandatory.

TABLE VI.

TYPES OF OPERATION PERFORMED FOR PEPTIC ULCER

Type of operation	*No.*	*Deaths*	
Suture of perforation (D.U. 36; G.U. 1)	37	4	10.8%
Cautery excision of ulcer	2	0	
Gastro-jejunostomy (vagotomy in 8)	27	4	14.8%
Pyloroplasty	7	0	
Revision of previous anastomosis	3	0	
Gastrotomy (bezoar and gastric ulcer)	1	0	
Subtotal gastrectomy	78	5	6.4%
For D.U. 42 (vagotomy in 5)			
" G.U. 24			
" D.U. & G.U. 6			
" Stomal U. 12			

In certain members of the series additional operative procedures were carried out as part of the operation which was directed primarily at the gastric condition. The extra operations included the following: appendectomy in 16; cholecystectomy twice; removal of duodenal diverticula in 2; one nephrectomy for a large calculous hydronephrosis; a single ovarian cyst; repair of incisional hernias following previous stomach operations in 4. In another small group interventions were carried out at a separate time, but for problems related directly to the gastric surgery, namely: relief of intestinal obstruction, 2 operations a year apart in one patient; jejunostomy once; drainage of subphrenic abscess in one case and of a pelvic abscess in one.

Some of the points listed in the above Tables call for special mention.

Perforation.—This complication is relatively common in duodenal ulcer cases, the present series including 36 of these, and a history of a previous perforation was noted in 11 cases reviewed. In passing, it may be noted that this complication had occurred in two of the cases of gastric carcinoma mentioned earlier, and one of these was only months before I removed a large cancer. The rare coexistence of duodenal ulcer and gastric malignancy is discussed in a paper by Fischer *et al.*[6] From my limited experience, perforation is not common in benign gastric ulcer; when it does occur the margin of the ulcer should be biopsied, for two cases of perforation of malignant ulcers were noted (omitted from above series) to a single instance of a benign lesion. The frequency of perforation by malignant gastric lesions has been pointed out by Boyce.[7] The ages of these cases ranged all the way from 13 to 77 at the time of perforation. Four examples of a second perforation were discovered. Contrary to a popular belief, to the effect that healing of ulcers may be expected following the complication under discussion, I have noted a tendency among patients who have perforated at any time to show repeated episodes of trouble until drastic treatment is meted out. The boy of 13 in this series illustrates this point. He was repaired elsewhere and started on medical management. By the time of my resection, less than four years later, he had bled seriously a number of times and there was a real degree of stenosis. It may be added that he is now 22, married and possessing a son, and normal in all respects, and free from any further ulcer troubles. I have had no personal experience with the conservative management of perforated ulcers as recommended by some of late. My experience leads me to believe that there are rare cases where more should be done at operation than mere simple closure of the hole, but the decision involved requires careful judgment by an experienced surgeon.

Stenosis merited special consideration in 44 cases of the present series. It was deemed to be due to reaction about an active ulcer when fulfilling most of the following conditions: patient under about 50 years of age; history suggestive of active ulceration as judged by duration, intensity, amount of pain, etc.; high gastric acidity; x-ray evidence, including definite local tenderness during fluoroscopic manipulation; rapid subsidence of the obstruction under a policy of gastric rest and washing out. Conversely, a cicatricial cause was supported by greater age, long history lacking evidences of acute and active ulceration, low or absent free hydrochloric acid, failure to respond to conservative management for a week or longer, and characteristic x-ray findings. This latter group is small; it is ideal for the so-called physiological operations to promote gastric emptying, namely, gastro-jejunostomy and pyloroplasty. Such gave good results and freedom from further ulceration. These lesser operations should not be done for the first group outlined above, for many of these will return with more trouble, and a far more serious underlying cause added by the unwise type of operation. My series includes a number of these difficult problems, with anastomotic ulcers and complications of such; in most of these the original operation had been done elsewhere, but there were several in which I had been influenced unwisely, operating at smaller hospitals out of town, where the decisions had to be made without adequate investigation too often, and where proper facilities for gastrectomy were not available. I feel strongly that all gastric and duodenal cases merit study and observation by men experienced in this work before operations are done, and the procedure chosen should be as definitive as we have today, and as free from risk. It is essential that we regard effectiveness of the procedure first, and then make it

safe. The apparently safer small operation too frequently leads eventually to far greater hazards from new complications and tougher secondary operations.

Hæmorrhage was a leading symptom in 41 of the present series. It has always constituted a threat to life. This is very strikingly so as age increases, notably with the sclerosis of vessels common after the age of 50, and the inability of these stiff-walled pipes to assist in the natural processes that normally provide for the temporary arrest of arterial bleeding. It is my considered opinion that any patient who has a history of even a single exsanguinating hæmorrhage in the past, or of two or more lesser bouts of bleeding, calls urgently for thorough check up and assessment as a likely candidate for operative attack. This is true of any age, but surely it should be obligatory after 50.

The patient who reaches hospital during or immediately following a session of grave hæmorrhage provides a real problem calling for great care and judgment. Most of these are bleeding from an open artery of some size, the superior pancreatico-duodenal artery or one of its branches in the case of a posterior, penetrating duodenal ulcer, or one of the gastric arteries in the lesser omentum in the case of a penetrating gastric lesion. One of my cases, resected as an emergency for uncontrollable bleeding, had the left gastric artery projecting in the floor of his high gastric ulcer, with only partial plugging by clot. It is not understood just why these large arteries bleed in a succession of spurts, each being likely to cause shock and collapse of the patient. The patient who shows evident shock has probably lost not less than 2,000 c.c. of blood. Lesser losses may at times be suspected by the "tilt test", the patient being elevated from a flat posture to 75 degree position, and showing a disproportionate rise of pulse rate, perhaps faintness, etc. Massive blood transfusions are urgently necessary, and the response must be watched with great care while the least sign of further hæmorrhage is appreciated. Probably no one else can duplicate the results reported by Meulengracht[8] for his conservative management of these cases. In most hands, and under the best of hospital conditions, there are a number of deaths in any series, unless the potential fatalities can be anticipated and subjected to urgent operation of effective type. Many writers agree that any person who cannot be controlled in 24 to 48 hours of good hospital care with transfusions of from 1,500 to 2,500 c.c. must receive such emergency gastrectomy (Holman[9] and Heuer[10]). This policy has governed the control of three cases in the present group. The principle bears out the plan long followed by Finsterer, with early operation sought in all cases of ulcer hæmorrhage, and within the first 24 hours if at all possible. There is much to be said for this view today, for most of the cases of grave bleeding should have a gastrectomy as a delayed procedure in any case (even if tided over the emergency), and a real argument can be advanced for doing it in all just as soon as proper arrangements can be made and the patient's state can be restored sufficiently. The argument is the same in essence as that for early appendectomy in all with acute appendicitis, where removal early obviates the danger of complications, and ultimate excision is deemed advisable in any case. Once a stage of uncompensated shock has persisted for any period of time, and after multiple massive blood replacements have provided the patient with an internal fluid medium that is really foreign, the dangers of the repeating hæmorrhage are tremendous, and any operative intervention is fraught with grave risks. Various attempts have been made from time to time to handle the problem of the bleeding ulcer by partial and indirect types of operation. In the main these have failed. Where operation is required under these circumstances it should be subtotal gastrectomy, with removal of the ulcer, and (it is hoped) permanent freedom from later ulceration.

Analyzing a series of bleeding peptic ulcers, Jones[11] found a total mortality of 7.8%, with figures of 2% for the age group below 45, and 12 and 21% respectively fitting the decades from 60 up. Holman[9] found a mortality of 13% reduced to 5% by seeking selection and prompt intervention in those with potentially fatal bleeding. Heuer[10] reported a fatal type of hæmorrhage in 15% of cases and he too stressed the indications for early life-saving operation. Three cases of the present series fall into this group, without a death; one desperate intervention in 1938, after five days of uncontrollable blood-loss, ended less fortu-

nately. When the plea is put forward for earlier effective management of these difficult cases, one does not forget that some of them present no small problem concerning clear demonstration of the bleeding site prior to abdominal section. We have encountered a case in point.

The question of interval resection where bleeding has occurred earlier, can be wisely resolved only by consideration of all factors for the individual case, as age, past history of ulcer behaviour and response to treatment, the site and type of ulcer, and the likelihood that the patient will do his bit or not. One man of 48 was resected after four years of precarious existence, with 4 serious hæmorrhages, and the haunting dread of this ever before him; he reported recently, seven months later. His gratitude and obvious peace of mind were most gratifying.

Intractable pain was a prominent symptom in the present group of cases. Pain is always hard to evaluate objectively. Patients differ markedly in their tolerance. Their distress must be assessed against the background of the pathological lesion, as far as this can be demonstrated by all our present methods combined, in relation to the faithfulness with which conservative treatment has been followed, and in regard to the psychological aspects of the individual. As an indication for operation, this complaint was usually only one feature. Many of these cases might be classified as failures of medical treatment. Frequently the cause lay in a chronic ulcer, penetrating deeply into an adjoining viscus, and causing symptoms which differed in quality, and intensity, and persistence, from the typical ulcer picture. Such cases can, as a rule, be relieved of their misery promptly by gastrectomy or vagus nerve section, or combined procedures, and I know of no other way in which comparable and lasting relief can be afforded them.

Penetration through the wall of the duodenum or stomach into a neighbouring structure occurred in 43 cases. Most of these had other complications. Diagnosis of penetration of a posterior duodenal ulcer is frequently impossible by x-ray, and it must be kept in mind in the clinical appraisal of the problem. My records include several cases where a succession of ill-advised abdominal operations had been performed on patients for undiagnosed intense abdominal pain which was relieved ultimately after gastric resection for the penetrating ulcer which had been missed. One woman of 36 came to me after 4 such operations, and after two exsanguinating hæmorrhages, in terrible distress, and without a positively established basic diagnosis. Operation revealed an enormous cavity, not less than 2 inches in depth, excavated into the pancreas and liver. Her relief was dramatic and lasting.

Suspicion of malignancy arises in connection with most gastric ulcers and in certain other cases of lesions close to the pylorus. My experience parallels that of most writers in this field, and lends support to the following tenets: Gastric ulcers should be regarded as almost certainly malignant, and calling for immediate gastrectomy, under these conditions: (*a*) If situated on the greater curvature; (*b*) If associated with a filling defect; (*c*) When achlorhydria exists.

Grave suspicion should be attached to another group, where conservative measures should be brief, perhaps only two weeks or so before reconsideration and recheck: (1) Very large crater, *e.g.*, exceeding 2½ cm. in diameter. (2) Irregular contour. (3) Situation on the lower half of the lesser curvature. For other varieties of gastric ulcer, of the "addition defect" class, and on the upper half of the lesser curvature up to 1 inch from the œsophagus, and when not associated with achlorhydria, the policy should be 4 weeks of thorough medical management followed routinely by a complete recheck and re-evaluation. If doubt remains as to complete radiological healing of the lesion, irrespective of the clinical improvement, operation should be performed forthwith. One patient in our series showed remarkable progress, with relief of symptoms and a gain in weight amounting to 5 pounds, but there remained a suspicious radiological finding. Exploration revealed a carcinoma that was resectable apart from a liver full of metastases. It is estimated that "occult malignancy" is not very uncommon, a resected gastric ulcer revealing carcinoma to microscopic examination in 10.1% (Ransom[12]).

The *relative factors* which influence towards operation in cases of doubt call for no detailed discussion. It is apparent that the man with a long or bad past history can be expected to progress much the same, and this should colour

one's advice. Likewise his ability to take care of himself. Gastric acidity studies should include night secretion volume, and amount of free acid, to show the conditions to which the ulcer is subjected during the long unprotected night period.

As stated earlier in this paper, it has been felt that the best end-results are obtained by partial gastrectomy where operation is indicated. Ogilvie[13] favours this procedure as best satisfying the requirements of any good ulcer operation, by radical removal of gastric acidity in three ways. (1) The zone of high acid secreting mucous membrane of the body is removed. (2) If transection of the stomach with all the nervous, vascular and peritoneal connections, is carried out within 1 inch of the œsophagus, there is a somewhat selective section of the vagal secretory fibres. (3) The entire pylorus must be removed, or at least all of its further mucous membrane, to abolish the hormonal after-secretion. The matter of choice of operative procedure, for each case of peptic ulcer calling for attack, is a large subject, and its consideration appears to lie outside the desirable limits of this paper. There are many controversial aspects. The merits and demerits of the different operations, or of slight technical variations, are upheld by many.

TABLE VII.

ELECTIVE OPERATIONS FOR PEPTIC ULCER SINCE JANUARY 1, 1943

Subtotal gastric resection alone	49
Resection or gastrojejunostomy with vagotomy	13
Vagotomy alone	16
(Previous resection or gastrojejunostomy in	4)
	78

Total, 78 operations for 1 death (1.28%).

No detailed analysis of end-results has been attempted, for many of these cases are relatively recent. However, it is exceptional that these can be classed as other than excellent, or at least good. I feel that vagotomy is still too new a procedure for any final appraisal; it has given prompt relief from symptoms in a number of cases. The principle of sectioning large nerves supplying other viscera, for a local lesion, leaves much to be desired. The operation, by which ever route, is of much lesser magnitude than resection, and many experienced gastric surgeons favour it strongly (*e.g.*, Crile[14]). The limited place of gastro-jejunostomy is well established today, but it has been driven home to me that even this procedure is not without risk in the elderly and feeble, and its technical performance in the past has left much to be desired in some cases. Three of these appear in my series as "Revision of Anastomosis". One had a small stoma, far too high up for effective functioning. In the other two the stomach had been anastomosed to the ileum once, and to the transverse colon once. Similar cases have been reported by Brown, Calvert and Brush.[15] These cases provided dreadful problems, with intestinal obstruction, huge anastomotic ulcers, nutritional disturbances, and dangerous technical operations were needed to restore the original status. One of these had four major operations before his eventual successful resection. Such errors support my plea for careful study and planning in order that the first operation should be right and definitive.

SUMMARY

1. A series of personal operative cases of gastric malignancy has been presented briefly. This included 65 patients, one having a lymphosarcoma, the others carcinoma. Resections of varying degrees of magnitude were completed in 39, the remainder having palliative or simple exploratory procedures.

2. Unfavourable initial features in this group included advanced age (56% over 65 years), large tumour masses spread beyond the stomach and a high incidence of metastases already established (63.1% in lymph glands). In 30 cases graded pathologically with respect to the primary lesion, 63.3% fell in the high grade groups (III and IV).

3. Some of the principles involved are outlined and illustrated by selected cases. Reference is made to the results obtained today and the fact that these can be bettered by appreciation of the following points:

Early detection offers the only hope of progress. Gastric cancer must be sought out when symptoms are in the least suggestive. Complete diagnostic services must be used more freely, and repeated more often. Both the public and the profession need to attack the matter aggressively.

Surgical advances in recent decades, with a careful operation as only one part in a well-ordered campaign, and due emphasis being given to every phase of preparation and after-care, make possible and advisable determined attempts at removal of a large proportion of even advanced and aged cases.

Both the diagnostic and surgical facilities are highly specialized. Each problem needs individual evaluation and a planned operation, with due appreciation of differences in route of access, and details of management, on the basis of adequate experience.

4. Gastric cancer ranks high as a killing disease, especially in elderly men.

5. A series of 174 operations for duodenal and gastric ulcers in 152 patients, is reviewed and the salient points are set out.

6. The complications and factors that call for surgical handling are listed and discussed in some detail.

7. The types of operative procedure carried out are tabulated and the place of each receives brief mention. Some of the errors in surgical management are noted.

8. It is emphasized that all peptic ulcer cases require careful appraisal from time to time, and above all to make sure that any operation is the right one, as definitive as possible, and that its execution should be made "safe".

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ADMINISTRATIVE MEDICINE

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["*For the Honourable Physician, the first consideration will always be the welfare of the sick. On his conscience rests the comfort, the health and the lives of those under his care.*"—Code of Ethics, Canadian Medical Association.]

EVERY physician is bound by oath to place the welfare of his patients above every other interest. In every day and age, this principle is fundamental and the insistence by the profession that its members adhere to it rigidly is responsible for the high standards of medicine that we have today. While the form of practice changes with the passing of time, the underlying principle remains constant. Whatever his field of endeavour, be it surgery, cardiology, pathology or administration, the doctor must direct all his efforts towards one end—the welfare of the sick.

Administrative medicine is a development of recent times, brought about by the changes in our social and economic life. Up to 100 years ago, there was no need for such a specialty; medicine was practised by individuals and every doctor was deemed to be competent to treat any and every disease that came to his notice. He made his own tests, concocted his own medicine and carried out his own treatments. However, as the field of medical practice broadened with each new scientific discovery, he found himself unable to cope alone with the increasing number of techniques and facilities at his disposal. The apothecary, the nurse, the technician and the therapist were added, each in turn, to his list of associates and the practice of medicine has ceased to be vested in the individual. Medicine, today, is composed of an organized group of specialized sciences and professions, each of which is an outgrowth of medical science or an addition to it. Each exists only for the purpose of improving the welfare of the sick.

The expansion of the medical organization has necessitated co-ordination and direction. In the early days, this was supplied by a senior physician in the group who was chosen because of his wisdom, his experience in medical practice and his qualities of leadership. Clerical assistants were appointed to aid him in his administrative duties and he functioned as a part-time administrator in addition to his professional responsibilities. With the continued development of the organization, its administration became more intricate; the physician administrator, untrained in business methods, placed increasing reliance upon his clerical assistants and finally ceded the administration of the group to them. The office clerk became successively the bookkeeper, the accountant, the manager, the administrator, the superintendent, the president and finally the director of the group. Gradually, the link between physician and administrator became weaker and finally dissolved. At this stage in the evolution of the medical organization, the doctor ceased to dominate it; physician and administrator went their separate ways and continued their development according to their own fundamental philosophies.

Today, instead of being masters of a great scientific and professional body to be used as a powerful instrument for the good of hu-

manity, physicians, with rare exceptions, are subject to laymen whose decisions are dictated, not by their sworn obligations to the sick, but by other considerations. Physicians remain the responsible members, but bear responsibility without the control which responsibility should entail. While physicians alone are competent to determine what is in the best interests of the patients, they are now cast as mere advisers to the administrators who have the power to grant or to withhold as they see fit the means necessary to provide medical services.

Examples of this development are in evidence everywhere; the majority of our hospitals are controlled by government agencies, church organizations, fraternal orders, private corporations and other non-medical bodies; drugs, surgical instruments, scientific supplies, therapeutic equipment and prosthetic appliances were commercialized long ago under mercantile control; medical fees are regulated by non-professional insurance groups, government agencies and arbitration boards; medical education is modified by political, religious and ethnic viewpoints; medical appointments to universities and hospitals are made by laymen, sometimes in opposition to the recommendations of the medical staff. There are more, but these examples will suffice to make the point: *physicians do not control the means by which they render medical services,* but they are held morally, if not legally, responsible for the provision of medical services. This fact is amply demonstrated by the modern tendency to blame the profession for the scarcity and high cost of medical care. Loss of control of the medical organization has started a trend which is transforming medicine from an art into a craft. In some countries a physician's office hours, the location of his practice, the number of patients he may treat and the quality of service he should render are determined by non-medical officials, while in the extreme, even the fundamental laws of science have been perverted to suit political, social and economic ideologies prescribed by party leaders.

The steps leading to this loss of control are not too difficult to trace. They are a normal consequence of the social and economic changes which have taken place since the turn of the century. The physician, primarily interested in the welfare of the sick, has concentrated on improving methods of alleviating disease at the expense of his administrative and commercial education. The administrator, faced with an ever-expanding organization, has been obliged to concentrate on business efficiency with little time to devote to the medical aspects of administration. The result is that, in every modern medical service, there are two points of view which are frequently opposed one to the other; that of the physician, bound by oath to subordinate all other considerations to the welfare of his patients, and that of the administrator, trained in the principles of business efficiency. While the physician regards administration only as an aid to the treatment of his patients, the administrator is primarily concerned with making ends meet, often losing sight of the purpose of his administration.

It is inevitable, therefore, that a sharp division of opinion over the conduct of medical services should arise from time to time between the physicians and the administrators, with no common ground for settlement of differences. Indeed, one of the major problems confronting the administrator of a medical service today is the development of harmonious relations with the medical profession. Relations are strained because of the inability of one side to appreciate the attitude of the other, with the result that no compromise can be reached. The solution of the problem of administering medical services appears to lie in the appointment of persons trained both in medicine and in business administration. This solution is by no means an easy one, for it involves the blending of two conflicting ideals in one personality. While the education of the physician is based on altruism, that of the business man is founded on personal gain. Nevertheless, if the administration of medicine is to be compatible with the aims of medicine, persons must be trained to reconcile these two divergent points of view. Where this has been done, there is a minimum of discord.

A small proportion of medical graduates are engaged in the field of administration, for few physicians can adjust themselves to an ideal opposite to that which they have so recently sworn to uphold. The demand for administrative physicians still exceeds the supply and will continue to do so for a long time to come. Untold opportunities in hospital administration, in health insurance, in the management of group

clinics and in the direction of public and private medical services lie before the medical graduate who can combine successfully the principles of commerce with those of medicine.

The alternative is to train business men in the principles of medicine, and some progress has been made in this respect by the establishment of schools in hospital administration, schools which are also open to physicians. Yet, it is doubtful that the alternative will ever be satisfactory, for, short of a complete training in medicine, it is difficult to see how a layman who has not himself experienced the responsibility for the care of the sick with its attendant worries and the satisfaction which follows the successful management of an illness, could acquire the ideals of the medical profession.

The question is often raised as to why it is necessary to have a physician to administer a medical service when the greater portion of administration has nothing whatever to do with the treatment of patients. Hawley answers that "it is a great fallacy to say that a non-medical man can control any medical operations leaving the actual care of the patients to the doctors; because nothing goes on in a hospital or in a medical service as a whole — utilities, supplies, recreation — nothing goes on around a medical service that does not in some way affect or impinge upon the treatment of the sick".

In some instances success has attended the administration of medical services by non-medical persons, for example, hospitals operated by clergymen, nuns, missionaries and nurses. Those rare non-medical administrators who have mastered the fundamental principles of medicine are in fact, if not in name, administrative physicians who are worthy of the highest regard. They are the exceptions to the rule that the profession is generally dissatisfied with lay control. It must not be assumed that the mere acquisition of a degree in medicine qualifies a person to administer a medical service. Indeed, physicians have provided some notable failures in this respect because of lack of understanding of business principles. The physician untrained in administration is no less unsatisfactory than the administrator who lacks knowledge of medicine.

Administrative medicine is the management of the means whereby medical services are rendered. It is the co-ordination of those professional, scientific, technical, social and economic services which, acting together, provide the highest quality of medical care to the patient. It is, in short, all the administration which pertains to the diagnosis, care, treatment and rehabilitation of the sick. It includes the supervision of those countless details which are necessary to fulfill efficiently the purposes of the medical profession, namely, to improve the welfare of the sick.

It is contended by some that the employment of a physician in an administrative capacity is a waste of medical training, a contention founded on a misconception that all doctors should treat patients. This is a false impression for there are many fields of medicine where doctors do not treat patients and administrative medicine is one of these. Like the pathologist, the academic professor, the diagnostic radiologist, the hygiene officer and the experimental surgeon, the administrative physician must apply the principles of medicine on a broad but less personal basis than in the care of the illnesses of the individual: like them, he is not personally responsible for the management of disease but only for giving specialized advice and assistance to his clinical colleagues.

The administrative physician must ensure that every effort of every person and every material resource in a medical service is co-ordinated so as to produce the maximum benefit to the sick. On him falls the task of executing the recommendations of the medical profession with the greatest economic efficiency. By reason of his specialized training and by the consent of his confrères he is regarded as the executive head of a medical service, the spokesman for the collective ideas of the physicians who render the services. It must always be presumed that any group of physicians will decide honestly the course of action that is in the best interests of the patients, but the intention is not always apparent to the lay mind. It is incumbent on the administrative physician to explain satisfactorily, in simple language, the object of any medical proposition; non-professionals must never be left in doubt that medical policy is decided on any grounds other than to improve the welfare of the sick. He alone does not decide medical policy for he is not competent to do so and indeed, no one member of a medical service should determine

a course of action for no one physician can know every aspect of medicine. Medical policy can only be formulated by a medical group in free and open discussion, and the administrative physician must submit his personal convictions to the decisions of the collective whole.

The existence of the administrative physician is dependent upon a group of medical units to be administered. Administration is not an end in itself but merely a cohesive force which guides individual units as an integrated body towards a common goal. Since each unit contributes a part of the motivating force of the whole, it follows that the administrative physician can never be the master of the group but only its executive servant. Thus, the administrative physician whose actions are at variance with the majority of his group is no longer a cohesive force but an agent of disorganization and self-destruction.

Though he is recognized as the executive head of a medical service, the administrative physician has no greater rank or privilege than any other doctor in the group; he is entitled only to equality of consideration. He may contribute ideas and opinions born of his experience and specialized knowledge but he may not impose his views on his fellow physicians, regardless of the powers conferred on him by non-professional bodies. He issues orders for the government of a medical service but does so only on the advice of the majority of its members. By virtue of his position he must have discretionary powers to do what is necessary to maintain order but his decisions are always subject to the scrutiny and approval of his confrères. As in any democracy it is unwise to vest too much discretionary authority in a chief executive except for emergency action.

The administrative physician must combine the attributes of the clinical physician with the efficiency of the business executive. On the clinical side, he must have a sympathetic understanding of the patient's problem through experience in the practice of medicine. A thorough knowledge of all medical specialties is not required but a reasonable comprehension of the methods of each is essential. The procedures of the nursing service, the techniques of physiotherapy, the principles of nutrition and the activities of the medical social service are among the professional subjects which he should be able to discuss, if not with authority, at least with intelligence. On the administrative side he must be familiar with the principles of finance, accounting, engineering and personnel management. A working acquaintance with the law, with purchasing methods, with insurance, with government organizations, with benevolent societies, with institutions of learning and with labour unions, is most important.

As leader of the group, he must be an educator, interested in the training of the professional, technical and lay staff under his jurisdiction, capable of inspiring his lay associates with the ideals of medicine and a living example of dedication to the service of the sick. It is his duty to maintain within the group the highest standards of professional conduct in accordance with the ethics of the medical profession and to impose penalties for infractions of the laws of medicine.

Though the medical group may decide what is in the best interests of the patient, it happens more frequently than not that the means to implement these decisions are in the hands of non-medical persons whose main concern is financial. In such circumstances the administrator must translate quickly and accurately, in terms of money, the benefits which the physicians wish to confer upon the patients. He must show, in a concrete way, the value received for the money expended. On the other hand, he must readily appreciate the immediate and potential effects of economic developments, such as a reduction of financial resources, on the welfare of the patient under the care of his group. The administrative physician must be well endowed with tact and diplomacy but must be firm in his insistence that what is best for the patient must always prevail. He must never allow material considerations to overshadow the welfare of the patient, but the interests of the patients must be served without extravagance or wasted effort. The administrative physician who condones inefficient, though well-intentioned medical or administrative procedures, is doing a disservice to his patients by rendering the practice of good medicine economically impossible. A keen appreciation of relative values is absolutely necessary, for he must obtain the highest quality of medical service for the least possible cost.

To be successful, the administrative physician should be regarded as a confrère by the medical staff of his organization and respected as a leader by his administrative colleagues. In the final analysis he can have but one loyalty—to the patients under his care; and but one incentive—to improve the welfare of the sick.

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FACE AND BROW PRESENTATIONS*

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A REVIEW has been made of the face and brow presentations which occurred in 31,534 patients delivered at the Royal Victoria Montreal Maternity Hospital over the 14-year period from January, 1935 to January, 1949. There were 45 face presentations and 38 brow presentations.

The incidence of face presentation was 0.14% or one in 700 cases, and of brow presentation the incidence was 0.12% or one in 829 cases. Brow presentation is a transient mechanism and all these could not be classified as "persistent" brow presentations. These figures are at variance with those usually quoted as the accompanying table shows.

Author		*Face*	*Brow*
Posner	1943	1:529	1:3543
Rudolph	1947	1:576	
Reddock	1948	1:550	
R.V.M.M.H.	1950	1:700	1:829

Posner[6] in 1943 reviewed the subject thoroughly, and in the recent literature, Rudolph[8] and Reddoch[7] have reported on large series of face presentations. The present study endeavours to assess the results obtained with conservative treatment of the deflexion attitudes.

Predisposing factors.—Of the 83 cases with the deflexion attitude there were 37 (44.5%) with no apparent cause, while in others there was more than one factor evident.

The two groups are tabulated separately to emphasize that similar factors predominate in both, but in the face presentations prematurity with congenital anomalies are most frequent. In the other deflexion attitudes a contracted pelvis or an oversize baby are more important as predisposing factors. However, routine x-rays were not taken of the pelves so these statements are based on clinical impressions.

No tumours of the neck[3] were noted to be present in any of the babies.

Parity	*Face*	*Brow*	
Primipara	20	14	41%
Multipara	25	24	59%

Parity plays some rôle in both groups, but it is possible that the results in multipara are not satisfactory because even those with bad obstetrical histories are not as carefully watched in early labour as the primipara.[11]

Diagnosis.—In almost every case the diagnosis was made on vaginal examination late in labour. In only three cases did abdominal palpation suggest that a deflexion attitude was present and this was verified by x-ray examination. The x-ray is not infallible however, and in other cases where x-rays were taken at or near term and deflexion attitudes diagnosed, the subsequent course proved that spontaneous correction into a flexion attitude occurred either before or during labour.

Rupture of the membranes.—In both groups the membranes ruptured spontaneously in a large proportion of the cases early in labour but this did not appear to have much significance. However two prolapsed cords occurred in brow presentation with spontaneous rupture, and a third cord prolapsed after artificial rupture of the membranes late in the first stage of still another brow presentation.

In one of these the dilatation was such that nothing could be done before the child perished and craniotomy was subsequently performed. The second had sufficient dilatation to permit a version and, with the cord protected, labour progressed to the point where a living fetus could be extracted. The third followed spontaneous expulsion of a bag. Version and extraction were done but the baby was deadborn.

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TABLE I.

FACTORS TABULATED

Face	*45 cases*		*Brow*	*38 cases*	
No apparent cause		17	No apparent cause		20
Contracted pelvis		3	Contracted pelvis		9
Android	2		Gynæcoid-android	1	
Platypelloid	1		Android	3	
			Platypelloid	4	
			Generally contracted	1	
Prematurity	4		Prematurity		3
Macerated fetus	1				
Congenital anomalies	2		Large baby (4,000 gm. or over)		5
Anencephalic fetus	12	19			
Large baby (4,000 gm. or over)		2			
Hydramnios with normal baby		1			
Placenta prævia with bag insertion		1	Soft part tumours		2
			Fibroids	2	
Pendulous abdomen		2	Bicornuate uterus		1
External version		1	External version		1
Compound presentation		1	Compound presentation		1

Surgical induction for disproportion created many problems, and five of the brow presentations in this series followed this procedure. The complications following artificial rupture of the membranes or bag insertions for induction in cases of disproportion were such that these practices were discontinued years ago.

Types of delivery in face presentations.—Approximately 62% of the face presentations delivered spontaneously; 13% were delivered by elective low forceps. The remaining 25% required manual aid and an operative delivery which varied in difficulty in proportion to the degree of cervical dilatation and the tone of the uterus. Four of the ten babies in the latter group were deadborn.

The conversion method used most commonly with success followed Thorn's technique.

Types of delivery in brow presentations.—There are two cases which are recorded as having delivered spontaneously as brow presentation. The first was in a para VI whose labour extended over 33 hours and the brow remained posterior until late in the second

TABLE II.

Type of delivery	*Face presentations*	*State of child*	
Spontaneous	28	Alive and well	14
Spontaneous after conversion to flexion attitude	1	Deadborn-monstrosities	10
		Neonatal deaths	5
Operative	16		
Type			
Low forceps	6	Alive and well	4
		Stillborn-monstrosities	2
Mid forceps	3	Alive and well	3
One after manual rotation			
One after manual correction			
One after manual conversion			
High forceps	3		
One after manual correction		Alive and well	
One after conversion		Deadborn	
One after failed manual correction		Deadborn	
Version and extraction	3		
One elective		Alive and well	
One after failed forceps		Alive and well	
One after failed conversion		Deadborn	
Conversion successful	3		
Conversion failed	1		
Duhrssen's incision	1		
Failed forceps	2		
Craniotomy, hydrocephalic fetus	1	Deadborn	

stage when rapid rotation occurred spontaneously. The baby weighed 3,690 gm. and did well. The typical moulding of a brow presentation was present. The second occurred in a premature labour in which the baby weighed 2,300 gm. This child had a large meningocœle and died three hours post-partum of hæmolytic disease of the newborn.

The 36 (95%) other cases required manual aid with forceps manipulation and this was often very difficult. The following procedures were done:

Correction to a flexion attitude	14
Correction to a complete extension attitude	4
Delivered as face to pubes, ?brow	11
Version and extraction	5
Craniotomy and extraction	2

In reviewing the charts it was apparent that it was rare that one manual procedure was completely successful, and delivery was accomplished after much trial and failure.

Postpartum hæmorrhage occurred in 9 cases and in 5 manual removal of the placenta was necessary. Uterine packing was done in 3 cases, not all of which were hæmorrhage problems. The third stage was abnormal in approximately 19% of this series in contrast to the usual incidence in the hospital of less than 1%.

The soft part trauma was rather less than one would anticipate after reviewing the types of delivery. Routine episiotomy was performed in 52 cases and in one a bilateral episiotomy was required. One third degree tear resulted from a brow delivery (face to pubes) and this healed well. Lacerations occurred in other cases but were not extensive.

Cervical lacerations were repaired in 5 cases, but no rupture of the lower uterine segment or body of the uterus was recorded.

The anæsthetic.—In the early cases chloroform was used routinely but from 1936 onwards, nitrous oxide and oxygen with ether, and later cyclopropane, were replacing the chloroform. For intrauterine manipulations the latter is the anæsthetic of choice, but it is not commonly used. In recent years a low spinal anæsthetic has been given for low and mid-forceps and relaxation of the pelvic floor is complete while the baby suffers no depressant action on its respiratory centre. However for intrauterine manipulations deep anæsthesia with ether or chloroform are to be preferred.

The puerperium.—There were no maternal deaths in the cases under review. The morbidity of the two groups cannot be satisfactorily tabulated since the standard of morbidity was changed in 1947. The morbidity however showed but a slight increase over the average figure.

The babies.—In the face presentations 4 were non-viable, 16 were premature and 25 were full term. Congenital abnormalities were present in 27% of the babies in the face presentation group.

TABLE III.

Type of delivery	*Brow presentations*	*State of child*
Spontaneous	2	Alive and well 1 Died—hæmolytic disease 1
Operative	36	
Low forceps	6	All alive and well
Manual correction to face	2	
As face to pubes	4	
Mid forceps—with or without forceps rotation	21	Alive and well 20 Deadborn 1
Manual correction to flexion	10	
Forceps correction to flexion	2	
Manual correction to face	2	
As face to pubes	7	
High forceps Manual correction to flexion with forceps rotation	2	Alive and well 2
Version and extraction	5	
Elective	1	Stillborn 1
Prolapsed cord	2	Deadborn 1
Failed forceps	2	Alive and well 2
Craniotomy with extraction	2	Deadborn 2
Failed forceps	1	
Dead baby: prolapsed cord	1	

TABLE IV.

THE BABIES BORN AS FACE PRESENTATIONS

Nonviable (under 1,000 gm.)		4
Premature (under 2,500 gm.)		16
Full term		25
Premature		
Born alive, and discharged well		4
Neonatal deaths		2
Prematurity and atelectasis	2	
Stillborn		1
Multiple congenital anomalies		
Deadborn		9
Macerated	1	
Anencephalic monsters	8	
Full term		
Born alive and discharged well		20
Deadborn		4
Trauma of labour, version and extraction: N.W.	1	
Trauma of labour, high forceps; 2,760 gm. and 3,990 gm.	2	
Craniotomy; hydrocephalus	1	
Neonatal death; anencephalus		1
Fetal mortality		41.4%
Fetal mortality—corrected		12.1%
Average weight of full term babies		3,141 gm.

In the brow presentation group 35 babies were born at or near term, 3 others were premature, of which one had hæmolytic disease and a meningocœle.

TABLE V.

THE BABIES BORN AS BROW PRESENTATIONS

Premature (under 2,500 gm.)		3
Born alive and discharged well	2	
Born alive—neonatal death Hæmocytic disease, meningocœle.	1	
Full term		35
Born alive and discharged well	29	
Born alive with left facial palsy discharged well	1	
Born alive with fractured skull transferred to M.N.I. for decompression. Survived	2	
Stillborn	1	
Version and extraction with forceps to a.c.h. 3,820 gm., intracranial hæmorrhage		
Deadborn	4	
Version and extraction with forceps to a.c.h. 2,830 gm., intracranial hæmorrhage	1	
Intrauterine death with five hour second stage, mid-forceps, 4,008 gm.	1	
Craniotomy One failed forceps 3,090 gm. One prolapsed cord Bandl's ring, N.W.	2	
Fetal mortality		15.7%
Fetal mortality corrected		13.1%
Average weight of full term babies		3,403 gm.

DISCUSSION

The obstetricians[9] in the eighteenth century were performing manual rotation, manual correction and version and extraction for face and brow presentations and in the present series there was nothing new in the way of treatment. In modern obstetrics the aseptic technique, modern operative and anæsthetic procedures, chemotherapy and blood transfusions benefit the mother and child. The wastage of child life in these deflexion cases is still high but with advances in pædiatrics the baby stands a better chance of survival, especially those born prematurely.

In the management of the labour, early diagnosis and reassessment are vital if a deflexion attitude develops. As shown in this review the diagnosis was usually made in advanced labour by a belated vaginal examination. In modern times the tendency is to perform a vaginal examination when the progress of labour is not satisfactory and rectal findings are indeterminate. If this custom is followed and the vaginal examination is supplemented by x-ray investigation, late diagnosis will be eliminated and active corrective treatment will be instituted. This will facilitate delivery and minimize the maternal and fetal trauma. This applies equally to multipara and primipara.

The fact that most of the face presentations will deliver spontaneously while the brow presentation will require assistance sooner or later, is stressed. While no Cæsarean section was performed in this series, in recent years it has been re-emphasized that the operation is sometimes indicated.[5, 6] If the case be potentially infected then a Cæsarean-hysterectomy or an extra-peritoneal operation may be done. Each case must be considered individually and a second opinion is sometimes invaluable. High forceps and version and extraction have but little place in the management of deflexion attitudes, and no place in the neglected case with scanty amniotic fluid and the uterus in a state of tonic spasm.

SUMMARY

Forty-five face presentations and 38 brow presentations occurred in 31,534 deliveries at the Royal Victoria Montreal Maternity Hospital and the results are reviewed.

The incidence of the face and brow presentations was 0.14 and 0.12% respectively. This

varies from the usually quoted ratio of face to brow as 3:1. If the anencephalic monsters were separated from the face group the incidence would be 0.1%.

The "dangerous multipara"[11] has been encountered in these cases and closer supervision of the multipara in labour would enable treatment to be instituted earlier and thus prevent maternal and fetal trauma.

The diagnosis is most commonly made after vaginal examination with labour well advanced and it might have been anticipated if this examination had been done with the rupture of the membranes. The x-ray is a valuable adjunct to diagnosis. The recognized methods of management of the face and brow presentations[1, 2, 4, 10] will enable one to cope with most cases, with Cæsarean section reserved for the few where the combination of pelvic disproportion and the deflexion attitude is present. Version and extraction are contra-indicated in these cases when the diagnosis is made late in labour.

Postpartum hæmorrhage due to uterine atony or lacerations has a high incidence in this series, 19%. Uterine packing and cervical laceration were more frequent than usual.

The corrected fetal mortality rate for the face presentations was 12.1% and for the brow presentations it was 13.1%. With careful management of premature babies the former incidence may be improved. No maternal death occurred and the morbidity and length of hospital stay were within usual hospital practice.

CONCLUSIONS

Earlier diagnosis of the deflexion attitudes with manual correction, when indicated, before delivery, results in less trauma to the maternal tissues and the baby.

If there be an associated cephalo-pelvic disproportion present then a lower segment Cæsarean operation may be the procedure of choice with a Cæsarean-hysterectomy or extraperitoneal section being indicated if infection be present or suspected. If the fetus has perished, craniotomy and extraction should be performed.

I wish to express my appreciation to my colleagues who have permitted me to use their cases and to Dr. T. Primrose who assisted in the early studies of the case reports. This paper in part was read by invitation at the Annual Meeting of the Canadian Gynæcological Travel Society, New York, 1947.

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MALIGNANT MISCHIEF*

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IN tackling this tricky euphonious subject, "Malignant Mischief", it is I who truly feels mischievous and yet I believe the subject material to be presented is not only timely but in reality long overdue. The preparation of this thesis has been a short exercise in professional literary etiquette, for personal views have had to be tempered with diplomacy, criticisms with tolerance, gloom with sunshine, and fervour with sanity; always realizing that the little flowers in my own back yard do not always bloom, nor are they invariably fragrant.

Soliciting your indulgence, I propose to ramble from students to quacks in an effort to reveal what, in my opinion (and one man's opinion is never taken too seriously in a democratic country), comprise certain weak links in the overall chain of cancer control. If, through these remarks, some benefit accrues to the cancer patient, the tedious effort involved in compiling "Malignant Mischief", which by the way cost me a day's trout fishing, will have proved itself worthwhile.

Let us first consider the Public, the Doctor, and Cancer Education. To say the least, John Public is an odd fellow. He is young or old, stupid or bright, male or female, black or white, in effect a conglomerate collection of protoplasm endowed with human nature. It is true, he can be educated, to a point. Gradually, and it is a desperately slow process, he is being educated to attend to that which is most dear to him, his health, and his life. Thanks to the Canadian Cancer Society with its provincial

* An address given at various Divisional Meetings.

branches, and its local units he is insidiously learning the symptomatic warnings of curable cancer. Are we as doctors hospitably opening the doors to this altruistic national agency and acting as happy hosts for its representatives until a unit in our own village, town, or city is formed? I suggest we have been more than a little careless in this regard and the initiative should be ours. Once formed we will be the welcome guest, not the host, and the hopeless stage 4 mother whom, heretofore, we listlessly referred for therapeutic appeasement or palliation may now, through us, return to her family.

Would we dream of depriving children of vaccination and inoculations? No, not even if we do 10,000 to prevent a single case of infection. Then I ask you, why not treat with a similar human civility the parents of those children who, having heard of cancer detection and prevention, wisely consult you, upon whom their lives depend? Is it not true that we are lukewarm to the added strain of an extra thorough physical examination on what appears to be a robust citizen? If so, the corollary is true, that we are lukewarm to the effect of cancer education. Most Canadians are smart enough to protect their children: the time is close by when they too will strive harder to protect themselves. The effective answer to this new challenging problem rests with each practitioner. He must either be willing and prepared to be his own Cancer Detection Clinic, which is truly possible, or it rests with him through organized medicine in Ontario and throughout the Dominion, short as it is in time and manpower, to give leadership in Cancer Detection Centres to which the busy doctor may refer his patient, thereby relieving himself of systematic vaginal, rectal, laryngoscopic or other exacting examinations.

You will see I hold no brief for those who are opposed to Cancer Education. Am I heartily in accord with the methods used, or the effectiveness thereof? No, not entirely. The program is patchy; on the whole, doctrines being spread are accurate enough, yet excess sentimentality here and there, particularly with reference to children, suggests that the general principles can be overdone by detail. If, however, you have at any time been reported by the press, you soon learn that reporters follow what they believe to be a popular appeal pattern: what to you may be gross distortion of fact, to them may be defended upon the principle of literary leeway. One might say that in Ontario, for five years only, has a serious effort been made in cancer education and, perchance mistakes have crept in. We can fully rely upon the officials of the Canadian Cancer Society to profit by experience. Let us remember that this society initially was sponsored by the Canadian Medical Association which always should maintain, as it does now, adequate representation on both National Directorate and Council.

As to effectiveness, I might ask how far did you and I get in the second grade? This educational campaign has just passed through kindergarten stages. Furthermore, and this is the significant paramount point, for the recipient citizens themselves its maximum effect is cumulative, not immediate, and, therefore, will manifest itself supremely only when youth and youthful adults of today approach the cancer age.

I would predict that twenty years hence, one-twentieth the educational effort will produce twenty times the present result; what is more, instead of one broad educational blast aimed at heterogeneous Canadians, psychologists and pedagogues (not doctors) will have determined that different ages, different races (such as the Esquimo), different social groups require equally variegated teaching. In this respect today, both the Canadian and American Cancer Societies are weak. It takes time, indulgence and money to perfect a new idea.

Meanwhile, let us review the Medical Curriculum, Cancer and the Student. If teachers of medicine in Canadian universities sincerely endorse preventive medicine beyond the point of sanitation, then I suggest they will arrange physical examinations for their students every month, six months or year as they may deem recommendable. Cancer of bone and testis are the students' mortal malignant enemies but tantamount to the detection of some incipient disease whether malignant, tuberculous, mental or otherwise is the impression left with the student that the medical era of detection and prevention is fully upon us.

Passing from his own physical welfare to those of his future patients we might ask, are we succeeding in coaching him to recognize cancer; or as to the end results of management? He is a 1949 student, not of 1927 vintage like

myself when cancer clinics in Canada were a myth, when the profession was consolidating its enviable position toward tuberculosis, immunization and pasteurization; gloating over the conquest of smallpox, typhoid and diphtheria; striving to perfect diabetic and pernicious anæmia regimens; sweating over cholecystectomy versus cholecystostomy; frantically typing the pneumococcus and treating it serologically; smiling with some satisfaction over advances made in acute appendicitis; perfecting laparotomy on the chronic appendix: all in all by circuitous commendable routes projecting thousands and hundreds of thousands of lives into the cancer age.

Our colleagues before the days of Halsted, Roentgen and the Curies could well afford hearty reassurance and a slap on the back in lieu of a careful proctoscopic and vaginal examination. Pleasant though this medical art was, and ofttimes accompanied with a bottle of medicine, let us still be equally as hearty, but more selective in our reassurance, deleting dangerous artistic tradition from our practice as rapidly as medical scientific achievements so dictate. More and more patients will casually drop into the office. True as of yesteryear, there will be the usual share of psychosomatics, who incidentally do develop cancer, and another natural sensible group who if properly investigated, will gladly accept a negative verdict and go happily along. These people are timid about consulting a physician. Let us not say that cancer education gave them a neurosis. Let us combine modern scientific investigations with time-honoured medical psychology in dealing with these people lest we ourselves be guilty of creating their neuroses.

In view of modern public trends and professional developments are we handing out a balanced academic diet? No, perhaps we never did and never will, but a little stock-taking will clearly show how we are falling short of certain pertinent didactic and clinical calories, vitally essential for cancer control.

Suppose, for example, a student prior to his finals is presented with a classical cancer of the lip. Remember it is as classical to an experienced doctor as a dandelion to a botanist, and yet instead of saying, "This is cancer", he starts his differential diagnoses with herpes, includes cancer and ends down the line with chancre. How ridiculous for a student in botany to include a daffodil, just because it is yellow, in arriving at the diagnosis or recognition of the dandelion. A classical cancer that we can see and feel should be as distinctive to today's graduate as the gastrocnemius is to the anatomist or the Plymouth Rock to the farmer. I do not decry differential diagnosis as a means to the end, or as the soundest method for early clinical instruction, but having given the embryo student a list as long as a clothesline it behooves every clinician to shorten that painful memory work as fast as possible by garnering in masses of typical cases whether cancer or otherwise. The prime object today of teaching upper students diagnosis should be to recognize the condition when he sees it, so that only when the problem is atypical or rare will he have to arrive at his diagnosis by the painful process of elimination. An expert diagnostician automatically will be a perfect differential diagnostician. Let us aim higher in our teaching of diagnosis by making our students so familiar with the reasonably common entities that, when confronted with a lesion on the lip which is cancer, they will be encouraged and permitted to say, "This is cancer and nothing else".

I could enlarge upon the fallacies of differential diagnoses and the hours of painstaking histories involved. How much quicker to do sigmoidoscopy on the lady who passed a little mucus last Thursday than spend all available time in history taking, finalizing by treating her rectal cancer for one month as mucous colitis. And why? Because the doctor whose training was lacking in endoscopy, substituted an unbalanced differential diagnosis for a quick inspection of the rectum.

What then is the answer? Are we to create specialists out of students? No, but they must deliver so many babies during their course, and I submit that somewhere along the line a few extra hours must be salvaged, wherein they must do a certain number of proctoscopics, biopsies, vaginals, laryngoscopics, in addition to seeing and feeling dozens of accessible curable cancers. I could even suggest where the time for this training might be salvaged (not stolen) but the water is getting pretty hot right now and "He who fights and runs away will live to fight another day".

The nurse—(Perhaps I am on safer ground, but not much!) "How can ye believe if ye do

not see?'' Seven of ten student nurses graduating this spring* from a large university hospital have never seen a cured cancer patient. The remaining three were reluctant to express opinions: and yet the day prior to submitting the questionnaire sixty follow-up cases passed through their own cancer clinic, a goodly number of which were five year cures.

Admittedly, there is an apparent shortage of nurses, a shortage of teaching hours. The girls are young, faithful and cheerful. They receive lectures in all sorts of subjects including the details of anatomy. They waste valuable time with trays and bed pans. They can be seen in pairs in most outdoor services, but never in the cancer clinic, nor do they get one lecture in cancer control. And yet they are 1947 nurses, not 1927.

Do I overstate the facts in suggesting that the cardinal points they retain on the broad subject of cancer will arise from their exposure to victims admitted for terminal hospitalization, from assisting at big operations and from nursing radiotherapy problems or complications. This is good enough training in nursing care and procedure and yet these impressionable minds are deprived of organized demonstrations in cancer control and that happy follow-up experience in a cancer clinic. Here they would see the other side of the picture presenting the end results of nursing skill and thorough management on the early and curable cases. Here they would shake off that shroud of pessimism which has manifested itself in such expressions as, ''Don't have surgery'', ''Don't have radium'', ''Don't have x-ray'', and solicitously to a friend, ''It just can't be cancer''. Here too, they might catch the truth that their rôle in cancer is not alone through nursing care, but through that broad horizon of education in which sphere, because of their enviable liaison position, they stand unique. Organized medicine and nursing should be the central pillars of our Cancer Society. Are they? Add to these a third, Dentistry, and what a tripod of strength that would be to support the work of the C.M.A's educational child.

The dental student.—The pivot man to be in oral carcinoma. I do not know, but ask myself the question, ''Where and how well is he trained to recognize cancer of the mouth?''

Quacks and the friends of quacks.—Each of you could name many. No era has had more cancer, no disease was more complex, no age had more money, civilian doctors have been so few, life is sweet and enterprise is free. What an integrated combination of factors to fan the flame of blatant cancer quackery. Yes, they may be graduates of medicine, electrical engineering and nursing, graduates of folklore or chiropractic, or graduates of nothing but their deciduous teeth. What a heterogeneous collection of base humanity having as common denominators that feeling of continued persecution, and an inherent supreme pseudo love for saving human life which is surpassed only by their true love for gold.

Can we do anything about them? Nothing much by litigation, for they thrive on it, as did the famous Shakespeare. In any event, such procedures are out of our jurisdiction, but today's quackery threat is more than incidental; it is growing and it behooves us to lend our unanimous support to the Ontario College of Physicians and Surgeons in their continued efforts to strangle these nefarious rascals. If, or when, the College, for the purpose of more effectually controlling quackery, recommends certain changes in the ''Medical Act'', or the ''Act concerning the Commission for the Investigation of Cancer Remedies'', then our Directorate might advisably assemble its members in special meeting, or otherwise, to voice its power in support of such measures.

Meanwhile, wherein is our prerogative, our duty in counteracting the charlatan menace? I interpret the words of the College Registrar, Dr. Noble, who in speaking to the Medical Advisory Board of the Ontario Cancer Foundation said in effect, ''I would ask each one of you to indicate to your colleagues that one of the greatest contributions the practitioner of Ontario can make against cancer quackery, is to support and relieve your hopeless, helpless cancer patients to the end''. This indeed is our task.

Already the Cancer Society has pressed us for human interest stories to elucidate just such points. Last month for the first time I broke under the pressure, principally because our local unit had campaigned so hard, and not until the last week did they ask of me one

* The author is speaking of 1947, but possibly his statement may yet hold true.—EDITOR.

favour, a human interest story. I called in four convivial old cures; subjected them with diffidence and apologies to the reporter and there and then "Like Cortez who with watchful eyes gazed upon the Pacific", I was astounded to realize how eager they were to tell the whole world how in a recognized hospital they were cured of their cancers by recognized doctors. It was only an experiment and I felt pretty mischievous about it; yet it proved that standing alongside our meagre weapons against quackery is that intangible powerful force, the Cancer Society.

Please remember it is so easy, so much more pleasant, to eulogize, to elaborate on those time honoured strong links of cancer control which have brought us thus far. I am mindful of all of these positive features including the unique contribution of nursing care but somehow those of us associated all the day long with cancer see all the angles. Do you not agree that it is right, in fact our duty, to let our colleagues in practice officially know just what we see and how we feel?

TICK PARALYSIS

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TICK infestation is fairly common in the interior of British Columbia during the spring months, but paralysis is an infrequent occurrence. Most of the ticks are discovered and removed before much engorgement takes place. Only two previous cases of paralysis have been reported from the Similkameen (Princeton) area, one in 1915 and one in 1933. In 1948, four cases were reported in B.C., and the last case before that had been in 1945.

In British Columbia during 1949, one case was reported from Robson, two from Kamloops, and our two cases from Princeton. One of the cases in Kamloops, reported by Dr. J. A. C. Thomson, terminated fatally in respiratory failure. The patient, an 18-month female, had symptoms of general weakness, drowsiness, irritability and paresis of the right leg, for 24 hours before the tick was discovered. She died about 34 hours after the onset of symptoms.

In the "Textbook of Clinical Parasitology" by David Belding, the condition is described as follows: the disease is a progressive, ascending, flaccid, motor paralysis. The early symptoms are malaise, lack of appetite, irritability, inco-ordination, and paralysis of the lower extremities, at times with loss of reflexes. There may be diarrhœa, convulsions, and a slight fever or even a subnormal temperature. The paralysis ascends to the muscles of the thorax, deglutition and speech, and also involves the involuntary muscles of the anal and vesicle sphincters. Death results from respiratory paralysis, although most affected persons recover.

Two cases of tick paralysis were seen at Princeton, B.C., in May, 1949. Both cases occurred in 5-year old girls, and in both a single tick was found attached to the scalp.

CASE 1

The child was first seen about 11 a.m. The parents complained that she had shown some weakness in her legs when she first got up, and that it had become progressively worse until she was unable to stand. They recalled that there had been some transitory weakness the preceding morning, but it had cleared up completely and the child was apparently well on retiring. There was no history of recent illness.

The patient was a well developed girl of five. She did not appear to be ill, and had no complaints. Temperature, pulse, and respirations were normal. There was no stiffness of the neck or back. There was no vertigo or nystagmus. The child seemed dazed, and answered questions very slowly.

There was no impairment of motion in the upper extremities. She was able to do the "finger to nose" test as well as could be expected for her age. The trunk and abdominal muscles were normal, and she was able to sit up without difficulty. In the lower extremities also, the muscle power was apparently intact. The child was able to dorsiflex and plantarflex the feet against resistance. She could voluntarily flex and extend both knee and hip joints. It was noted, however, that lying on her back, she was able to raise each leg, but could not control the direction in which she lowered it. When she attempted to stand, she would weave around, and her legs buckled under her.

There was no loss of sensation of touch or pin-prick. Reflexes in the upper extremities and abdomen were normal. The knee jerks were absent, Babinski sign was negative.

A living tick, engorged to approximately ¾ in. by ½ in. was removed from the scalp near the vertex. Improvement began in 4 to 5 hours, and she was completely recovered by the next morning.

CASE 2

This child was seen a few days later than Case 1. The parents brought the child in, complaining that she was unable to stand. The clinical picture was so similar to the first case, that a tick was immediately suspected and located. Recovery was again complete within 24 hours.

In neither of these cases had the condition progressed to a true muscular paralysis, but rather there was an ataxia involving the lower

limbs. The nature or action of the toxin producing tick paralysis is not yet known. It has been described as affecting the lower motor neurones of the spinal cord and cranial nerves, but this does not explain why inco-ordination appears before the loss of muscle power. That the location of the tick might be of some significance is indicated by Dr. Thomson's case, where the tick was found on the left parietal area, and the child had a paresis of the right leg.

These cases emphasize that fact that wood ticks can be a real danger, and that they should be remembered especially in the early spring months in heavily infested areas.

Grateful acknowledgment is made to Dr. J. A. C. Thomson of Kamloops; Dr. J. A. Taylor, Director of Local Health, Victoria, B.C., and Mr. J. D. Gregson of the Dominion Entomological Laboratory at Kamloops.

RÉSUMÉ

Les auteurs rapportent deux cas de paralysie temporaire chez des enfants de cinq ans à la suite de piqures par des tiques. Ils constatent que ces insectes sont dangereux et que l'on doit penser aux lésions qu'ils causent au début du printemps. YVES PRÉVOST

The great physicians of all time have understood that medicine is not a study of disease, but a study of man: an individual who is a member of a family and who is part of the community. . . . The purpose of medicine is to make available to all the people, in the greatest possible degree, the achievements of science as they relate to the promotion of health and to the prevention and treatment of disease.—W. G. Smillie, M.D., *New England J. Med.*, January 12, 1950.

What I want to make clear is that to handle disease, or to handle the patient on the physical plane alone is to deal with only the half. The cure of the sick sometimes depends on kindness more than efficiency. The patient is sick—he wants his symptoms relieved. He wants comfort. He hopes for cure. He may think you have given him cure, but at least you have given him something of yourself if you are a good doctor.—Lord Alfred Webb-Johnson, *Rev. of Gastroenterol.*, **17**: 337, 1950.

YELLOW-FEVER MOSQUITOES WIPED OUT IN BRAZIL.—Complete success has been reported from the nation-wide campaign in Brazil to eradicate the *ædes ægypti* mosquito, the urban yellow-fever carrier, according to the WHO monthly Newsletter. It is expected that all *ædes ægypti* in that country will have been wiped out by the end of 1950. This achievement has led a WHO expert group on yellow fever to recommend similar eradication programs in other parts of the world.—(UNESCO)

POSTURE IN LUNG SURGERY*

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THE position in which the patient is placed on the table, so as best to facilitate the surgical approach, is an important factor in the success of any operation. As a general rule, for most parts of the body optimum access to the part is assured by having it uppermost, or as near as possible to the operator. However, the anatomical, physiological and pathological conditions peculiar to the chest, and particularly to the lungs, make modification of this principle at times advisable.

The postures at present used in lung surgery are: (1) the lateral position; (2) the supine position; (3) the prone position; (4) the erect or sitting position. Of these, the lateral position with the operative side uppermost has been for long the most favoured. In this position easy access is provided to the full length of any of the ribs which may require resection in both intra- and extra-pleural procedures. Hence the longest incision and widest exposure is provided. The most serious objection to this position, however, lies in the fact that the diseased lung is uppermost and the healthy lung, or more healthy lung in cases of bilateral disease, is underneath. If the diseased lung is the site of suppuration as is very commonly the case, even in disease primarily non-suppurative such as neoplasm, the infected secretions are allowed to gravitate into the larger air passages and thence into the healthier lung. Moreover, the better lung is at a disadvantage in that its ventilatory range is probably reduced by reason of its dependent position. This lung is most inconvenienced in open thoracotomy because then the operative lung more or less collapses and the heart and mediastinal organs move to the opposite side compressing the contralateral lung.

In both the supine and prone positions, such objections are adequately coped with. But both of these positions provide less wide access, because approximately one-third of the circumference of the hemi-thorax being explored rests on the table and cannot take part in the incision. The proponents of these posi-

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tions, however, point out with reason that while not as wide access is provided by them, the exposure is nevertheless adequate. Overholt has recently devised an operating table (Overholt-Comper table) in which the patient is slung between supports holding the pelvis and the manubrium sterni, thus leaving the full circumference of the chest exposed. He has further proposed that the operative side be the lower of the two by merely tilting the table laterally. Such a position has much to commend it from the patient's point of view, and for the surgeon who is experienced with it, offers no serious problems of exposure, at least of the extrapleural structures.

Many surgeons use a semi-prone position with the operative side raised, particularly for extrapleural procedures such as thoracoplasty. This position is subject to the minor objection that the surgeon is operating on the side of the patient furthest from him and to the more serious one that the position is apt to change through the slipping of the patient from this in-between position as the operation progresses.

The erect or sitting position has not been used widely on this continent but has had a considerable vogue in Europe where much of the lung surgery is done under local anæsthesia. The patient's head and non-operative side rest on padded supports, leaving the whole surface of the operative side free. Such a method has an advantage in that the ventilating range of both lungs is at a maximum. Operating under local anæsthesia the cough reflex is preserved, lessening the danger of sputum retention. In this connection, however, it is well to remember that the heavy premedication required for local or spinal anæsthesia in itself tends to abolish the cough reflex, and in order to actually preserve the cough mechanism it is necessary to see that the patient adheres to a regular schedule of cough, say every half hour during the operation and every two hours postoperatively. Cough is probably most effective in the erect position and in this position the danger of flooding the contra-lateral lung is greatly lessened. This position, however, is less suitable for general or spinal anæsthesia and in long or shocking procedures exposes the patient to the danger of cerebral ischæmia.

Whichever of the non-erect positions is used it is well to have the head of the table lowered so that the secretions that get into the larger bronchi will gravitate to the outside via the trachea. Since the trachea passes dorsally as well as caudally from the larynx to the bifurcation, the prone position best facilitates the action of gravity in clearing the trachea, but by lowering the head sufficiently the trachea can be given adequate downward slope in the lateral and supine positions.

The advantages and disadvantages of each position might be considered in more detail with respect to their application in the commoner procedures of lung surgery.

1. *Extrapleural thoracoplasty as employed in the treatment of pulmonary tuberculosis and tuberculous and non-tuberculous empyema.*— Since the essential part of this operation consists in rib resection, the lateral position which exposes the greatest length of rib has had the widest use. However, the objections listed above, namely flooding of the contralateral lung and restriction of its ventilation, constitute serious disadvantages in cavitated pulmonary tuberculosis and in empyema. This is particularly true in cases with large cavities and in empyema with broncho-pleural fistula, where copious fluid pus may enter the tracheo-bronchial tree and literally drown the patient.

For the past four years it has been my practice in cases of pulmonary tuberculosis with large cavities or abundant sputum to do the first stage of thoracoplasty anteriorly with the patient in the supine position. Through a six-inch incision over the second rib anteriorly running from the midline into the axilla, the medial fibres of the greater pectoral muscle are split and the lateral fibres divided between clamps, the lesser pectoral being divided at its attachment to the ribs. Through this approach the first, second, and third ribs can be resected to within an inch or less, of the corresponding transverse processes. The costal cartilages are removed and the ribs and interspaces being wider in front, a greater area of chest wall is decostalized and a greater degree of collapse is secured that can be achieved through the longer, more traumatizing incision used in the first stage posterior thoracoplasty. The supporting action of the scapula not being present in front, it is necessary to support the infraclavicular region with a large pressure pad anchored to the opposite shoulder. The second and possible further stages can then be done safely postero-laterally with the patient in the

lateral or prone positions. In the prone position it is somewhat difficult to get very far forwards on the first three ribs, but adequate lengths of the other ribs can be resected easily in this position.

2. *Extrapleural pneumothorax* can be done with equal ease with the patient lying in any of the horizontal positions. The posterior approach, however, has distinct advantages here because a two-inch portion of the fourth rib is quite enough to resect posteriorly in order to enable a wide pneumonolysis to be done, and the narrow ribs and interspaces behind facilitate an airtight closure of the chest. This is of vital importance in order to maintain the air space. The erect position with local anæsthesia has something to commend it here, because the lung falls away from the mediastinum with the pull of gravity, in this way aiding the development of the extrapleural space.

3. *Lung resection.*—The lateral position has been the most popular for lung resection. It has the advantage of wide exposure in that the entire length of a rib can be resected, through the bed of which the longest possible incision can be made into the pleural cavity, and the upper, lower, or middle lobes can be equally well exposed and explored. The hilar structures, however, tend to be obscured by the collapsed lung falling in against the mediastinum. In order to expose these parts, the lung has to be lifted away with forceps or pushed aside with retractors. This causes pressure on the diseased lung and expresses its infected secretions into the larger bronchi. The lateral position greatly favours the flow of this contaminated material into the underlying lung of the opposite side. Forcible traction on the hilar structures also tends to set up undesirable local vago-vagal reflexes which may lead to bradycardia or cardiac arrest.

Rienhoff has advocated the use of the supine position and anterior intercostal approach for pneumonectomy in malignant disease. He points out the advantages of a shorter incision, the speed of entry owing to the wider interspaces and the ease of separation of the ribs in front making it unnecessary to resect a rib. Moreover, the pulmonary artery being an anterior structure, can be ligated early in the procedure, thus stopping the entry of blood into the lung and possibly cutting down on the eventual blood loss. Furthermore, should the patient's condition make it advisable to break off the operation and divide it into stages, it can be terminated conveniently after ligation of the pulmonary artery, since the lung remains viable so long as the bronchus, bronchial artery and pulmonary veins are left intact. According to Rienhoff, animal experiments have shown that if a pulmonary vein is tied the corresponding portion of lung must then be removed because if left it becomes gangrenous.

The anterior approach, however, gives the least exposure of the bronchus which is a posterior structure. The success of lung resection depends perhaps more on correct treatment of the bronchial stump than on any other phase of the technique. More particularly is this so in bronchogenic carcinoma which is primarily a lesion of the bronchus. In my experience more radical removal of bronchus, better closure of the stump and more thorough removal of the mediastinal lymph glands particularly of the subcarinal group can be better accomplished through the posterior or lateral than through the anterior approach.

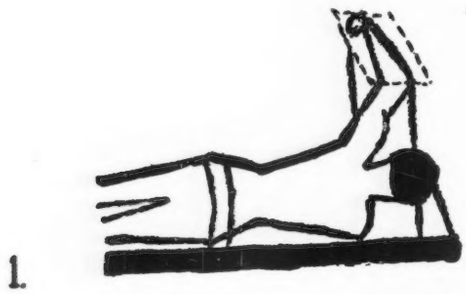
Moreover, in the case of a bulky firm atelectatic lung or a large tumour the anterior incision will not permit easy separation of the lung from the mediastinum, owing to the difficulty of dislodging the mass of the lung from the costovertebral gutter through the short incision. Hence adequate length of pulmonary artery or vein cannot be isolated to permit their safe ligation and division. Such a lung is more easily handled with the patient in the lateral or prone position because then the stiff bronchus which holds the lung to the mediastinum can be divided first and the blood vessels being elastic can next be exposed in greater length for safe ligation and division.

The prone position gives optimum exposure of the bronchus and as Overholt points out, permits its early ligation or occlusion so as to prevent the escape of infected secretions from the diseased lung. This position is ideal for resection of the lower lobe in bronchiectasis or lung abscess and can be described as mandatory for operations on particularly "wet" cases of suppurative disease, such as bilateral bronchiectasis.

The supine position is suitable for resection of the upper lobes in tuberculosis, or lung abscess.

4. For *transpleural drainage* of a lung abscess the prone position gives good access to a lower lobe lesion and the supine position to a lesion of the upper or middle lobes.

5. In cases of *exploratory thoracotomy* for undiagnosed lesions of the lungs, particularly when the lesion in question cannot with certainty be defined in its lobar or segmental relationships beforehand, the lateral position still gives greatest freedom of exploration and excision for all portions of the lungs.



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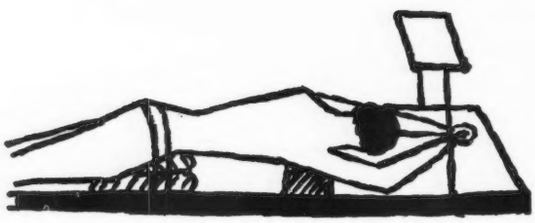

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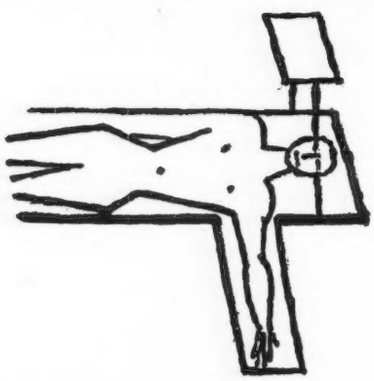

3.

To maintain the patient in the lateral position there are numerous types of braces and supports available such as the kidney rests used for nephrectomy. A wide adhesive band fixing the pelvis, with sandbags to support the chest anteriorly, functions fairly well, but the sandbags to be effective must lie against and hence prevent access to the front of the chest. Moreover, the patient tends to slump forwards into the semiprone position as the operation progresses. Both of these difficulties can be met by bandaging the forearm of the operative side to a simple rest fixed to the anæsthetist's screen (Fig. 1). This prevents the patient's slipping and leaves the whole of the hemithorax free for the incision.

For the prone position it is probably advisable to support the manubrium sterni and clavicles anteriorly and the pelvis posteriorly, leaving the abdomen and lower chest free for respiratory movement. While the Overholt-Comper table gives ideal working conditions, a firm oblong pad measuring 8 x 8 x 18 inches to support the upper sternum and clavicles together with two firm pillows under the pelvis suits the purpose very well. To prevent the patient slipping headward when the head of the table is lowered, a broad strip of adhesive passing over the lumbo-sacral junction fixes the pelvis to the table (Fig. 2).

For the supine position, the upper extremity of the operative side is placed extended outwards at an angle of 120° from the body so as to clear the axilla for extension of the incision into the mid-axillary area (Fig. 3). The extended arm raises the axillary vessels and brachial plexus upwards off the first intercostal space, where the latter is covered by the first serration of the serratus magnus. This gives safe exposure of the first rib when a long-bladed retractor inserted in the axilla is used to elevate the neurovascular structures out of danger. With this exposure practically all of the upper three ribs as far back as the corresponding transverse processes can be resected.

RÉSUMÉ

L'auteur énumère les quatre positions servant à la chirurgie thoracique: (*a*) la position latérale; (*b*) la position de supination; (*c*) la position de pronation; (*d*) la position assise. Il donne les avantages et les désavantages de chacune d'elles surtout au point de vue champ opératoire et drainage des sécrétions. (1) Les *thoracoplasties extra-pleurales*: dans les cas ou les crachats et les sécrétions sont abondantes l'auteur fait le 1er stage de la thoracoplastie en position de supination puis les deux autres stages dans les positions latérale ou de pronation. (2) *Pneumothorax extra-pleural*: celui-ci peut-être pratiqué dans n'importe laquelle des positions horizontales. (3) *Résection pulmonaire*: la position latérale est la plus populaire mais cependant le poumon collabé retombe sur le hile et les écarteurs envoient sécrétions dans le poumon sain. Quelques uns ont suggéré la position du supination qui a l'avantage de permettre la ligature immédiate de l'artère pulmonaire, cependant les bronches sont plus difficiles à rejoindre et la dissection des ganglions hilaires plus laborieuse. La position de pronation permet l'abord rapide des bronches; c'est la position idéale pour les cas de bronchieclasies. (4) *Drainage transpleural*: la position de pronation est la position de choix. (5) *Thoracotomie exploratrice*: la position latérale est encore la meilleure. L'auteur termine en indiquant les principaux moyens de fixer le patient à la table de opération.

YVES PRÉVOST

THE PLICATION OPERATION IN THE TREATMENT OF PERITONEAL ADHESIONS*

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PERITONEAL adhesions are an almost invariable complication of abdominal surgery. Duff[4] has found that 90% of individuals with the history of a laparotomy show evidence of adhesions at post-mortem examination. In most cases these cause no symptoms and produce no ill effects, but in some instances complications may arise from their presence. It is recognized that adhesive bands are the most common cause of intestinal obstruction in the young and middle age groups. Repeated episodes of obstruction may occur on this basis because even though the obstructing bands are divided they have a tendency to reform. Such cases present a grave problem and many of these patients become chronic invalids. Abdominal pain due to visceral traction or fixation by adhesions is a less clear cut entity. In the past some surgeons have advocated laparotomy for division of such adhesions. Many of these patients are psychoneurotics and the results of treatment are usually poor. However, cases do occur in which symptoms are due to the presence of adhesions and in which relief is obtained by division of the bands.

The pathology of peritoneal adhesion formation is well understood. Boyd[1] has pointed out that an inflammatory process may terminate in one of three ways; complete resolution, necrosis and death or repair by fibrosis. In any abdominal operation, peritoneal injury occurs and if the mesothelium is destroyed fibrinous adhesions are formed. If the damage has been slight, these adhesions may later disappear. However, in more severe trauma the fibrinous bands become organized due to invasion by the subperitoneal connective tissue. It is well recognized that in certain individuals adhesions form easily and there is a marked overgrowth of scar tissue. This is related to a tendency to keloid formation and these individuals are particularly liable to sequelæ.

The problem of preventing the formation of peritoneal adhesions is a complicated one. Boys,[2] in an excellent review, has summarized the various clinical and experimental approaches. Apart from the prophylaxis obtained by the limitation of trauma to the peritoneum, no method has proved to be effective in preventing or treating adhesion formation. Despite the utmost care, it is often impossible to avoid injury to the peritoneum. This is particularly true in patients who have had previous laparotomies or severe peritonitis. Large areas of bowel are denuded of serosa, and thus form the site of dense adhesions which may give rise to subsequent symptoms.

In 1937 Noble[6] introduced the principle of plication as a means of peritonealizing denuded areas of the small bowel and mesentery. He showed that such a procedure prevented the formation of distorting adhesions and decreased the incidence of obstruction. In 1945[37] he summarized his experiences with the plication operation and stated that it was effective in the prevention and treatment of adhesive peritonitis and its aftermaths.

Donaldson and Cameron[3] have confirmed Noble's results experimentally, and have been unable to find any harmful effects resulting from the procedure. More recently, Lord, Howes and Jolliffe[5] have reported the successful use of plication in three cases of intestinal obstruction due to adhesions. Despite these reports, the procedure has never achieved wide recognition.

The principle of the plication operation is simple. It involves folding a loop of bowel on itself in such a manner that denuded areas are covered. By the use of multiple plications, large raw areas may be obliterated. In this way the adhesions that form are so placed that the plicated loops are bound together. Noble states that since adhesions cannot be prevented they must be controlled so that there are no abnormal results.[7] Plication sometimes occurs in nature. All surgeons have observed the small bowel bound together in this fashion by fibrinous adhesions, and it is well known that such an arrangement does not interfere with intestinal function. Unfortunately, adhesions do not always form in this manner and it is then that the plication operation fills an urgent need. The method is of value in covering denuded areas

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of the small bowel which are the result of injury or infection or which follow the severance of distorting and obstructing adhesions. The technique of plication as advocated by Noble[5] involves the use of a continuous suture beginning at the root of the mesentery and continuing upwards until the bowel itself is reached. The approximation of the mesentery avoids leaving a fossa which may later cause obstruction. The limbs of the loop of bowel are then sutured together to form a narrow V. This constitutes a single unit of plication; others may be added as required. We have found it preferable to begin by suturing the bowel loops, and end by approximating the mesentery. This method keeps the mesenteric suture to a minimum and avoids the danger of injuring vessels.

Because of the potential value of the Noble plication operation we considered that an experimental appraisal of the method would be useful. We felt that it was important to assess its worth in preventing distorting and obstructing adhesions and to determine its effects on small bowel function and motility.

EXPERIMENTAL TECHNIQUE

Healthy adult cats weighing approximately 2 to 2.5 kgm. were used as the experimental animals. Under intraperitoneal nembutal anæsthesia laparotomy was performed through a mid-line incision. The small bowel was abraded at multiple areas from the ileocæcal valve to the ligament of Treitz. In order to assure adhesion formation, talcum powder was dusted over the abraded areas. In a control group of 10 animals the abdomen was then closed. In the experimental group of 10 animals the raw areas were covered by the plication technique. The extent of plication was varied from a single unit to multiple units involving the entire small bowel. Fine chromic catgut (000) on a fused intestinal needle was the suture material used in all cases. The animals were re-examined after one month and an attempt was made to evaluate the extent of adhesion formation according to the following scale.

Grade 1. Minimal adhesions over a limited area.

Grade 2. Several adhesive bands over a wide area.

Grade 3. Extensive scattered adhesions.

Grade 4. Massive dense adhesions.

In addition, intestinal motility was studied by the barium series and by recording intestinal movements at operation. The results are summarized in Table I.

In half the control group (5 animals) all adhesions were divided by sharp dissection and the entangled loops of bowel were liberated. The plication technique was then used to cover all raw areas and the abdomen closed. These animals were sacrificed after one month. The results are listed in Table II.

TABLE I.

EFFECT OF PLICATION IN INTESTINAL ADHESIONS AND MOTILITY

Animal No.	*Operation*	*Time of survival*	*Adhesions*	*Motility*	*Remarks*
1	Abrasion of bowel and talc	Sacrificed 4 weeks	Group IV	Normal	Angulation
2	" " "	" "	" III	"	"
3	" " "	Died 2 weeks	" IV	Obstruction	"
4	" " "	Sacrificed 4 weeks	" II	Normal	
5	" " "	" "	" III	"	
6	" " "	" "	" IV	"	Angulation
7	" " "	Died 4 weeks	" IV	Obstruction	"
8	" " "	Sacrificed 4 weeks	" III	Normal	
9	" " "	" "	" IV	"	Angulation
10	" " "	" "	" III	"	"
11	Abrasion and talc and plication of raw areas	Sacrificed 4 weeks	Group I	Normal	
12	" " " " "	Died 3 days	Nil	Gangrenous bowel	
13	" " " " "	Sacrificed 4 weeks	Group I	Normal	
14	" " " " "	" "	" II	"	
15	" " " " "	" "	" II	"	
16	" " " " "	" "	" I	"	
17	" " " " "	" "	" I	"	
18	" " " " "	" "	" I	"	
19	" " " " "	" "	" II	"	
20	" " " " "	" "	" II	"	

TABLE II.

EFFECT OF PLICATION ON PREVIOUS CONTROL GROUP

Animal No.	*Adhesions after 1st operation*	*Adhesions after 2nd operation*	*Motility*	*Remarks*
1	Group IV	Group III	Normal	No angulation
2	" III	" II	"	"
4	" II	" II	"	"
5	" III	" II	"	"
6	" IV	" III	"	"

DISCUSSION OF RESULTS

The results of this investigation clearly demonstrate the value of the plication operation as a means of controlling the formation of intestinal adhesions and preventing angulation and distortion of the small bowel. In all of the control group dense adhesions developed which caused angulation of bowel loops. Intestinal obstruction occurred in two cases. In the treated animals, although adhesions did form they were limited to the plicated area and never produced angulation. It is interesting to note that after adhesions were freed and the bowel plicated, no subsequent angulation or distortion developed.

Plication does not interfere with bowel function. There was no delay in the passage of barium through the plicated bowel and peristaltic waves traversed the curves of the plication without interference. There was no evidence of interference with small bowel

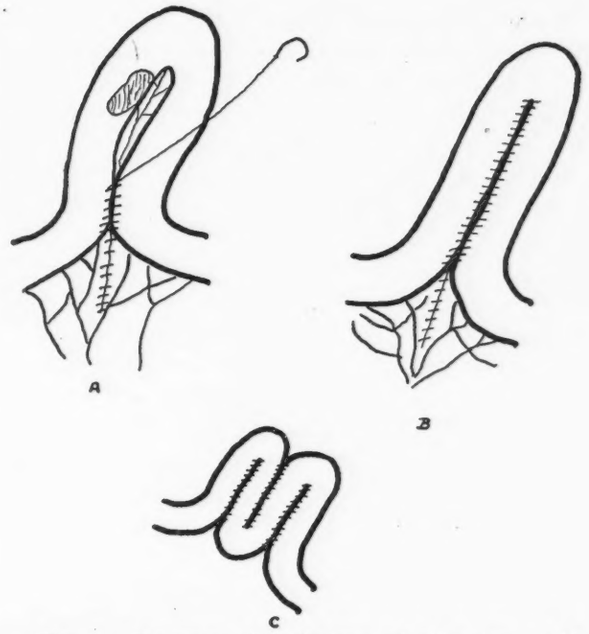

Fig. 1.—Diagram of technique of plication. (A) Beginning of suture. (B) Completed loop. (C) Multiple loops.

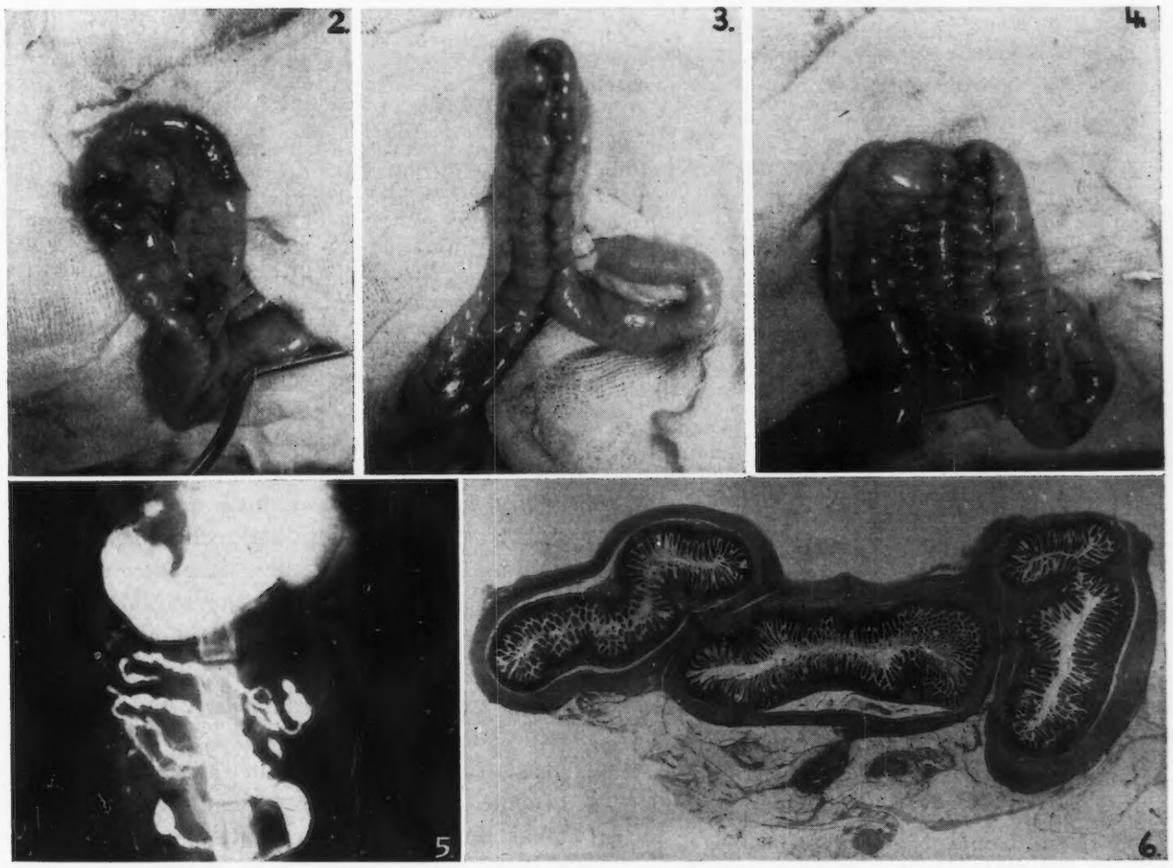

Fig. 2.—Plication is commenced, isolating the abraded areas in a loop. **Fig. 3.**—Completed single-loop plication. The abraded areas are opposed and an intact peritoneal surface remains exposed. **Fig. 4.**—Multiple loop plications for extensive areas of injury. Such a plication does not cause obstruction or interfere with intestinal function. **Fig. 5.**—Barium series in cat with 9-loop plication near the ligament of Treitz. There is no evidence of delay in the plicated area. **Fig. 6.**—Cross-section through plicated bowel one month after operation. There is no distortion of the lumen.

secretion or absorption. The stools were normal in all respects. In one animal, gangrene of the bowel occurred in a plicated area. This was caused by mesenteric thrombosis, due to a major vessel being included in the suture line. Apart from this technical error, no untoward effects were observed.

SUMMARY AND CONCLUSIONS

1. An experimental evaluation of the Noble plication operation has been attempted.

2. The operation is effective in controlling the formation of peritoneal adhesions so as to prevent angulation and distortion of the bowel.

3. The procedure does not interfere with small bowel function or motility and does not produce obstruction.

4. The Noble operation appears to be a satisfactory method of dealing with denuded areas of small bowel and preventing recurrent obstructions due to angulating adhesions.

The authors wish to thank Mr. Paul T. Roustan for his valuable technical assistance.

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THE PRESENT STATUS OF ORBITAL IMPLANTS*

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IT is generally accepted by ophthalmologists that, when an eye has been removed, the socket for both physiologic and cosmetic reasons should have some type of an orbital implant. A good cosmetic result following enucleation entails a normally filled orbit and full motility of the prosthesis. An implant in Tenon's capsule, or in sclera, helps restore the socket and gives a life-like appearance to the artificial eye. However, motility can be assured if the implant and prosthesis are made to interlock so that the movement of the implant is transmitted to the prosthesis. The implants about to be described do this. They result in wider excursion of the prosthesis and also transmit the normal, fast, spontaneous movements to the false eye. These attributes help conceal the fact that the patient is wearing an artificial eye.

Integrated implants were first introduced by Ruedemann[1] in 1946, and have since gone through progressive development. While many different implants, each varying slightly in size and shape, and the use of materials, have been described, there have been essentially three types.

The basket implant of Cutler[2] illustrates the simplest type. This cup-shaped plastic implant is completely buried, and when the socket is healed, a depression is formed corresponding to the depression in the implant. A conical stud is moulded on the posterior surface of the artificial eye to fit this depression. Movement is thus transmitted indirectly to the prosthesis. The range of motion of the basket implant is greatly improved by using an implant with attached ring, over which the recti muscles are directly sutured. The ball and ring implant of Cutler[3] consists of a central plastic body, and a ring of gold. Hughes[5] describes a similar implant made of vitellium. With these, a portion of the implant is exposed and the movement is transmitted by means of a pin on the back of the artificial eye fitting directly into a hole in the implant.

Experience has shown that the ball and ring implant frequently is extruded. If the ring is replaced by tantalum mesh, the muscles become firmly adherent to the mesh and more permanent results are obtained. The Ruedemann[1] implant eye, the Whitney[7] implant, the Stone-Jardon[7] implant, and Cutler's[4] universal implant, use tantalum mesh for the attachment of muscles.

All types of implants which have a portion exposed are open to stern criticism. They break the surgical dictum that a wound must become epithelialized to remain static and not break down. However, Cutler and Ruedemann showed that epithelium grew back around the implant. Only time will tell how permanent the results will be.

The two implants to be described are of similar principle. The first type is used after

* Read at the annual meeting of the Canadian Ophthalmological Society, June 18, 1949 at Banff, Alberta. From the Department of Ophthalmology, University of Toronto, Toronto General Hospital, Hospital for Sick Children and Department of Veterans' Affairs Hospital, Sunnybrook.

eviscerations. The body of the implant is made of plastic (methyl methacrylate), and is spherical, with a small neck 1 mm. in length and 11 mm. wide, at the anterior portion. There is a band of tantalum mesh 6 to 7 mm. in width around the anterior portion of the body, just behind the neck. A channelled groove in the plastic 1 mm. behind the anterior edge of the mesh facilitates the passage of sutures.

The second implant is of similar shape, but the tantalum mesh covers the whole posterior portion behind the neck. It is used after enucleations, and in old sockets where the eye has been previously removed. Only two sizes of each implant are used, namely 16 and 18 mm.

OPERATIONS

1. *Evisceration procedure.*—This operation is done in essentially the same way as described by Cutler. The entire posterior portion of the sclera and a piece of optic nerve are removed after the cornea has been excised, and the globe eviscerated. In this manner a collar of sclera, with the recti muscles intact, is left. The implant is introduced from the back and sutured in place.

At operation, a conjunctival incision, about 10 mm. from the limbus and parallel to it, is made in the inferior temporal quadrant between the inferior and lateral recti. The entire cornea is removed and the contents of the globe eviscerated. While the assistant holds the lateral and inferior recti with muscle hooks, a cataract knife is passed through the sclera behind the muscle insertions, and the incision enlarged horizontally. Stevens' scissors are used to continue this incision around the globe, behind the insertions of the muscles. The posterior portion of the sclera is pulled toward the conjunctival incision. It may be removed with enucleation scissors or a snare. The remaining collar of sclera is inspected and any irregular edges are trimmed. Three 3-0 double armed chromic catgut sutures are equally placed on the implant, the needle being passed through the mesh in the region of the groove. These sutures are pulled through the posterior incision and out through the corneal opening. The implant is pulled through from behind. The small raised collar of the implant now projects through and exactly fills the corneal opening. The sutures are passed through the sclera and conjunctiva, about 2 mm. from the cut edge and tied. The conjunctival incision is closed with an end of the chromic catgut suture. A plastic retainer is placed in the conjunctival sac, and an adhesive dressing applied. This is removed on the fifth day, the artificial eye is fitted at the end of the third week.

2. *Enucleation.*—If the eye is to be saved for pathological section, the following procedure is used. The conjunctiva is incised around the limbus, and the globe removed in the usual manner, each of the four recti being secured with a 3-0 chromic catgut suture. After bleeding has been controlled, the sutures are passed horizontally through the mesh, at the position of the groove.

TABLE I.

POSTOPERATIVE RESULTS

TOTAL NUMBER OF OPERATIONS DONE AT CHRISTIE STREET, SUNNYBROOK, HOSPITAL FOR SICK CHILDREN, AND TORONTO GENERAL HOSPITAL, BETWEEN SEPTEMBER, 1946 AND APRIL, 1949

Type of implant	*Number of cases operated*	*Implants extruded*
Scleral ring implants	14	2
Enucleation—Ball and mesh implant	22	1
Old sockets—Ball and mesh implant	16	0
Enucleation—Ball and ring implant	22	10
Old sockets—Ball and ring implant	10	2
Enucleation—Basket implant	8	2
Old sockets—Basket implant	4	1
Total	96	18

The sutures are then passed out through the muscle 2 mm. from the cut end and tied. The conjunctiva is pulled over the muscle attachments and secured by six interrupted heavy silk sutures to the anterior border of the mesh. A plastic retainer is placed inside the lids and an eye pad secured with adhesive strapping. The wound is not disturbed until the fifth day. The silk sutures are removed sometime after the third week, at which time fitting of the artificial eye is begun. An 18 mm. implant is used in adults, in children a 16 mm. is used.

3. *Operative procedure for old sockets.*—The conjunctiva is incised horizontally for 12 to 14 mm. in the central portion of the socket. With blunt dissection Tenon's space is opened. No attempt is made to find the muscle stumps.

TABLE II.

IMPLANT CASES DONE AT SUNNYBROOK AND CHRISTIE ST. HOSPITALS, BETWEEN SEPTEMBER, 1946 AND APRIL, 1949

Type of implant	*Removal of sutures in days*	*Days in bed*	*Days in hospital*	*Weeks between operation and fitting of eye*	*Final result*
Ball and ring, 3 cases.	18	5	10	4	1 successful 2 extruded
Ball and ring in old sockets, 2 cases.	18	5	7	3	2 successful
Enucleation with ball and mesh, 4 cases.	20	5	7	3	4 successful
Ball and mesh in old sockets, 6 cases	18	4	6	3	6 successful
Scleral ring, 4 cases.	Chromic catgut used and not removed.	4	6	3	3 successful 1 extruded.

Tenon's capsule is dissected free from the conjunctiva. A 16 mm. implant with mesh over the whole posterior half is placed in Tenon's capsule. Double armed 3-0 braided tantalum sutures may be used; 3.0 chromic catgut has since been found quite satisfactory. The two ends of the suture are passed through Tenon's capsule from the outside. The two sutures are then passed horizontally through the mesh at the position of the groove in the plastic, and then passed out through Tenon's capsule and tied on the outer aspect. Four such sutures are placed at the lateral, superior, medial and inferior positions.

The conjunctiva is carried forward and fastened with six interrupted heavy silk sutures to the anterior edge of the mesh. A retainer with peg is placed in the socket. The peg keeps the implant properly centred during healing. The postoperative treatment is similar to that described with enucleation.

A total of 96 integrated implants have been used, and of these, 18 were extruded at various times after operation. The ball and ring implants came out in the greatest percentage of cases, whereas ball and mesh implants used after enucleation and in old sockets were most satisfactory, being dislocated in only 2.6% of cases.

The optimum time to remove silk sutures from the conjunctiva in integrated implants was found to be eighteen to twenty-one days. When a plastic retainer was placed in the socket after operation, confinement to bed of three to four days was found adequate, and the stay in hospital reduced to five or six days. Fitting of artificial eye can be carried out any time after the third week.

Conjunctival discharge with all types of exposed integrated implants is greater than with buried or with no implants. This may be due to allergy or reaction to the plastic, or to bacterial infection. It may also be caused by exposed tantalum mesh, or a rough prosthesis. *Staph. aureus,* and *B. coli* are usually found in the discharge. The operative procedure is more involved and takes more time than the simple removal of an eye with buried implant. The possibility of extrusion of these implants cannot be overlooked. Counterbalancing these adverse features is the wide range of movement and the cosmetic results obtained.

Implants placed behind the scleral ring after evisceration give excellent cosmetic results and do not tend to be extruded and function well. In three cases the conjunctiva retracted from the neck of the implant 1.5 mm. on the temporal and nasal sides, but this did not reduce the movement of the prosthesis. While there is little tendency for implants placed in the old sockets to be extruded, movement is much less than that obtained after enucleation. Satisfactory results were obtained nineteen years after the enucleation in one patient.

Finally, enucleations using the ball and ring implants showed such a high percentage of extrusions, that the procedure was abandoned.

CONCLUSIONS

Exposed implants caused more discharge and produced more postoperative reaction than buried implants. However, the cosmetic result is better and when the tantalum mesh implant is used there is little chance of extrusion. This type of implant is worthy of continued use.

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CYSTS OF THE LUNG AND OF THE MEDIASTINUM*

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MEDIASTINAL cysts are almost always congenital in origin, whereas those of the lung may be acquired. The formation of these cysts is due to inclusion of aberrant cells during development. It has been demonstrated that aberrant embryonic cells can be included whenever there is cellular or bud division.

The foregut divides around the fifth week of the embryo's life into two parts: one, the tracheal or ventral bud, which will later develop into the respiratory tract, and the other, the œsophageal bud, that will form the digestive tract. When this division takes place, it may happen that a group of cells is included in tissues where they do not belong. This particular group of cells will later form into a cyst. This cyst will come under the name of bronchogenic, if the cells come from the bronchial bud, and as œsophageal or gastric if the cells are detached from the œsophageal bud. These cysts will be found mainly in the mediastinum and generally they lose their connection with the bronchial tree.

The development of the intra-pulmonary bronchial tract takes place by the division and subdivision of the primary bronchial bud. Thus, it is easy to understand that inclusion of embryonic cells in the pulmonary tissue may occur and that bronchogenic cysts may be found in the lung. These cysts keep their continuity with

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the bronchial tract and can easily grow into the bronchi to give rise to air-containing cysts.

The wall of a bronchogenic cyst is composed of a bronchial coating with ciliated and cylindrical epithelium, smooth muscular fibres, cartilage, mucous glands and elastic tissue. The cysts having a digestive origin contain pepsin and hydrochloric acid and are internally coated with pavement epithelium, if they are œsophageal in origin, and with a glandular mucosa, if they are gastric.

These bronchogenic or digestive cysts are of dysgenetic formation and are the ones most frequently encountered. We may also find teratomas as dermoid cysts. They are of ectodermal origin and contain ectodermal tissues such as skin, hair, teeth. These are always in the mediastinum. Hydatid cysts, of parasitic origin, are only exceptionally encountered in our country. There is also the pneumo-cyst, known to certain authors as focal emphysema. These cysts may well be mistaken for bronchiectasis as they are always acquired and frequently of recent formation. They grow in the pulmonary parenchyma when there is a rupture of the alveoli, or following a lesion of the thorax, an obstruction of the bronchus or an abscess of the lung. They can be differentiated from the bronchogenic cysts by their histological structure.

Contents of the cysts.—The mediastinal cysts, whatever they may be—bronchogenic, digestive, dermoid or hydatid are always filled with liquid, and are therefore opaque to x-rays. The liquid in the bronchogenic cyst is white, thick, and mucous, if not infected. That of the digestive cyst contains pepsin and hydrochloric acid. In the dermoid cyst may be found skin tissue, hair, teeth, etc., while the hydatid cyst contains echinococcus hooks.

Cysts of the lung may also be filled with liquid if they do not communicate with the bronchi; with liquid and air, or air alone, if they open in the bronchi. These are called aerial cysts of the lung.

Localization. — The pulmonary cyst can be found anywhere in the parenchyma of the lung but they are more often located in the hilus. Mediastinal cysts are found with decreasing frequency around the pulmonary hilus, the trachea, the carinal region, the œsophagus, the spine and the pericardium.

Clinical symptoms.—In the absence of secondary infection, symptomatology is essentially determined by the location and volume of the cyst. In many instances, the cyst remains completely unrecognized and is only found during a routine or a post-mortem examination.

If the cyst is infected secondarily, signs of intrathoracic suppuration will appear. Should it open into the bronchi, then we will have vomiting; followed by purulent expectoration that may last for months, or even years. If the cyst is not infected it may reveal its presence by signs of compression of the bronchi, with a dry cough, noisy respiration, cyanosis, progressive dyspnœa, asthma and even atelectasis. In childhood, dyspnœa and cyanosis increase rapidly and death occurs during the first year of life if the cyst should be located at the bifurcation of the trachea.

Compression of the œsophagus brings on dysphagia; and compression of the heart and of the big vessels may bring on sudden death. These cases rarely occur. The compression of the recurrent nerve is still more exceptional, but a typical case has been brought to our attention which we will recall a little later.

Roentgen findings.—These are very important in revealing the presence of a cyst, as clinical signs are often negative. It is not exceptional for a cyst to be found during a routine roentgenogram. The image is characteristic enough to attract immediately the attention of the radiologist. The cyst, bronchogenic or other, gives an opaque image, rounded and with perfectly sharp edges. Should the cyst be dermoid, it may contain substances of various opacities. If the cyst has opened into the bronchi, it usually shows a cavity with fluid level and very thin walls, which is found in the parenchyma of the lung with normal transparency. Fibrous bands sometimes cross the cavity.

This cystic picture can be mistaken for a thymic tumour, an aneurysm, a neurogenic tumour or any other solid tumour of the mediastinum. The thymic tumour is less sharp, extending beyond the mediastinum and protruding over the clavicle. Aneurysm is characterized by pulsation and can also be detected by angio-cardiography. The neurogenic tumour is located posteriorly in the costo-vertebral hollow whereas the cyst remains in front of the spine. Solid tumours of the mediastinum do not generally show a sharp edged image and the limits are often not clearly determined. Pneumo-cysts and cystic bronchi-

ectasis give clear rounded pictures with very thin walls.

Diagnosis can also be made by bronchoscopy but this method is generally useless except for detecting external compression of the bronchus.

It can be said that the diagnosis of a cyst is mainly based on roentgenograms.

TREATMENT

Today the treatment of the cyst of the lung is a surgical proposition, and therapy with sulfa drugs or antibiotics is only undertaken when there is a secondary infection. Any cyst should be surgically removed whether it is secondarily infected, shows signs of compression or remains inactive, as complications may occur. Being only an internist, I shall not venture into the field of surgery, but I may say, after seeing many of these operations performed, that they can be done when conditions are favourable and that we should not hesitate to recommend them. If the cyst is in the lung, a lobectomy will often be necessary and sometimes the lung itself will have to be removed.

Anæsthesia.—The administration of an anæsthetic in this type of operation is complicated by the lack of negative pressure due to opening the thorax, with all the consequent effects on the respiration and circulation.

The anæsthetist must know how to deal with and prevent these accidents. Preoperatively he should measure the vital capacity and the respiratory exchanges of each lung. He should eventually be able to prevent anæmia and remove the pus from the bronchi if need be. During the operation, anoxæmia must also be prevented by anæsthesia under intermittent positive pressure. In order to insure a free passage of the air, a tube has to be inserted into the trachea. If the bronchi contain pus, its diffusion into the healthy lung must be prevented by intra-bronchial intubation of the latter and by applying to the other a suction catheter with an attached inflatable baby balloon.

In order to prevent cardio-vascular reflexes and spasm of the bronchi, it is necessary to infiltrate the intercostal nerves with an oily solution of nupercaine so as to anæsthesize the bronchial mucosa before inserting the tube. It will be necessary to inject novocaine into the hilus of the sick lung and also block with this solution the sympathetic, the vagus and the phrenic nerves.

After the operation, the patient must lie on the side that has been operated upon and, if need be, the following treatment must be applied: bronchial aspirations; transfusions ranging from 500 to 1,500 c.c. of blood; oxygen for several days and even intravenous injections of papaverine.

CASE REPORTS

CASE 1

C.W., 19 years of age, was examined in 1930 and showed a cyst image in the right lung.

A puncture was made and anaerobic streptococci were found in the pus. Drainage was done and a continuously flowing fistula resulted. Four years later, Professor E. Sergent, of Paris, made the diagnosis of an infected cyst of the lung. The patient was operated on by Professor Archibald of Montreal. The patient recovered. Actually, it was a bronchogenic cyst.

CASE 2

M.C., 7 years old, showed a cavity with fluid level of the left lung and temperature. A lobectomy was performed and the patient died shortly after the operation. This was found to be a bronchogenic cyst with secondary infection.

CASE 3

Mrs. G.B., 58 years old, an advanced cardiac case, entered the Hotel-Dieu, March, 1949, and died within a few days. A previous x-ray had shown a rounded image with sharp edges above the right hilus. The postmortem showed that there was an inter-pulmonary bronchogenic cyst.

CASE 4

Miss Y.P., 16 years of age revealed a mediastinal cyst during a routine x-ray (Fig. 1). The patient had had no symptoms and the physical examination had been negative. On November, 1948, Dr. François Roy successfully removed a cyst as large as the head of a fetus, located in the posterior mediastinum. Five months later, a roentgenogram showed a perfect result (Fig. 2). This cyst had all the characteristics of a bronchogenic cyst.

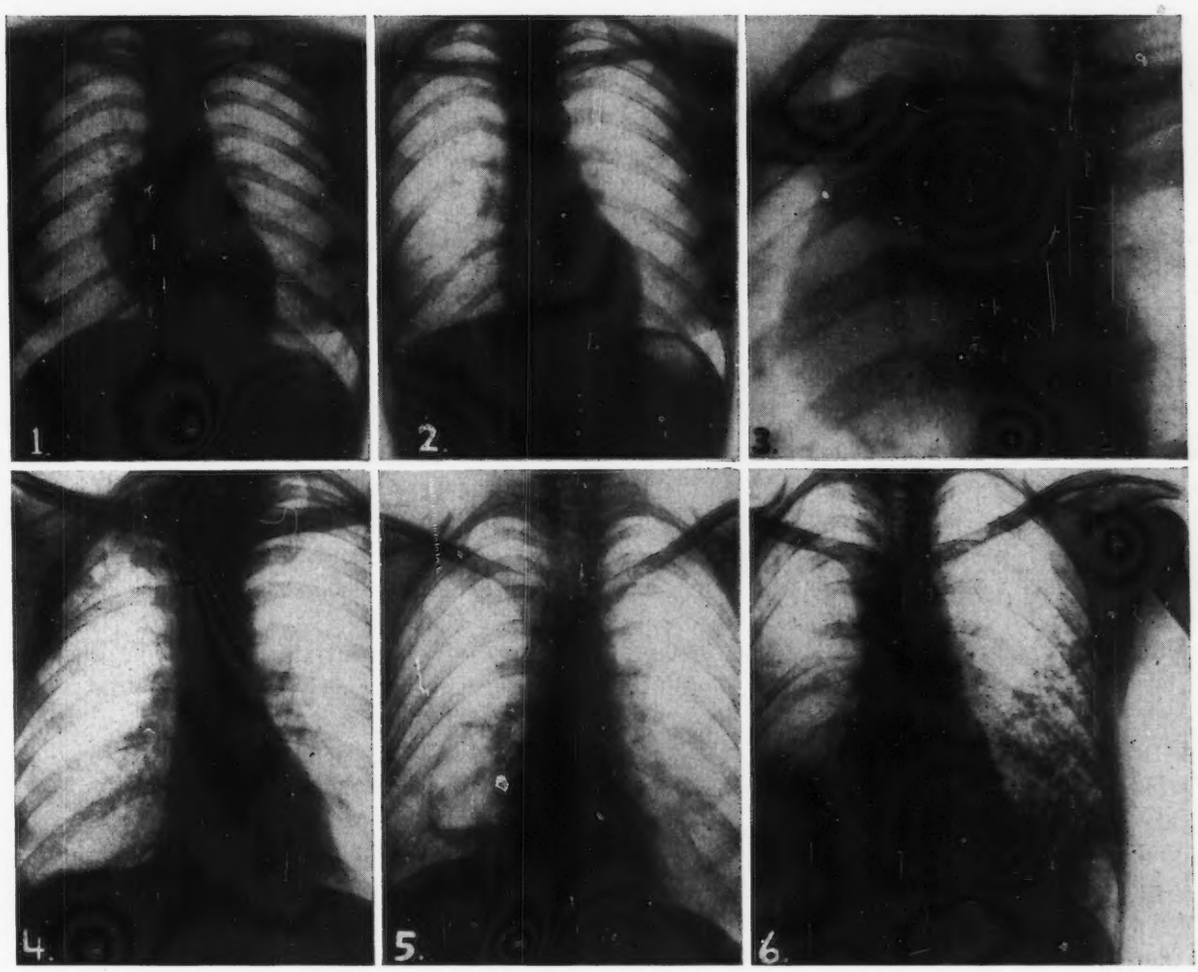
CASE 5

Mr. M.L., aged 31 years, was refused by the Army in 1942 because of a cyst in the superior mediastinum. Routine physical examinations were negative. An x-ray showed a rounded opaque picture with sharp edges in the superior mediastinum, extending to the right, and pushing the œsophagus to the left (Fig. 3). Laryngoscopy revealed recurrent paralysis of the right vocal cord.

The patient was operated on in December, 1948, and a cyst 7 x 5 cm. was removed from the postero-superior mediastinum. The histological examination revealed a cyst of bronchial origin. The patient left the hospital fifteen days after the operation. Hoarseness disappeared two months later, but fatigue, shortness of breath, pain in the right side of the thorax and weakness of the right arm persisted for a long time. An x-ray taken 4 months after the operation showed clearing (Fig. 4).

CASE 6

Mrs. F.D., 44 years of age and mother of 13 children. In 1944, she had frequent vomiting. A few weeks later, she had a costectomy because of a purulent pleurisy. From 1944 to July, 1948, the patient was in good health but she then started to cough, to expectorate and to run a temperature. Her general state of health became progressively worse.



An x-ray showed in the postero-inferior part of the right thorax, a large cavity with fluid level, sharp delimitation and very thin wall (Fig. 5). Bronchoscopy was negative and there were no tubercle bacilli in the sputum.

This was an infected cyst of the lung and Dr. François Roy operated in November, 1948. In spite of strong pleural adhesions a lobectomy of the right inferior lobe was done. This cyst revealed an image greatly altered by secondary infection, but nevertheless the bronchial origin could still be ascertained.

The patient left the hospital 24 days after the operation but was re-examined five months later. Coughing and expectoration had ceased and the temperature was normal. Her general state of health had greatly improved. The x-ray gave a clear picture (Fig. 6) though the patient was easily fatigued and still complained of pain in her right thorax and of a weakness in her right arm.

CASE 7

J.P., aged 30 years, in perfect health, was sent by his family doctor because of two pulmonary incidents during the last year. During these spells, he coughed and expectorated pus. In between times, there were no symptoms whatsoever. The physical examination was negative but an x-ray showed, at the base of the left lung, two rounded images which suggested pulmonary aerial cysts. Bronchoscopy was negative but bronchogram showed that the whole inferior lobe and the region of the lingula were transformed into a series of cystic dilatations of the bronchi. This was probably congenital and could be mistaken for pneumocysts of the lung.

We decided to wait till later to operate in case pulmonary infection reappeared.

CONCLUSION

Of these seven cases, six were bronchogenic cysts: two involved the mediastinum, and four involved the lung. Five of these were located on the right side.

The seventh patient had a cystic dilatation of the bronchi.

The diagnosis of three of these cases was purely incidental.

Of these seven patients, five were operated upon and one death was recorded.

It is to be noted that the postoperative picture is not as dramatic as one may think. After each operation a pleural reaction occurred, necessitating one to three punctures and penicillin treatment. After the operation two patients complained of pain in the thorax for several months accompanied by shortness of breath and weakness in the right arm. In the case of one patient a recurrent laryngeal paralysis disappeared after the operation.

It can be said that cysts of the lung and of the mediastinum should be surgically removed

when the general state of health of the patient is satisfactory.

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CONSIDERATION OF THE REQUIREMENTS AND TRAINING OF A PLASTIC SURGEON*

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FOR hundreds of years surgery has thrived on wars, and the art of plastic surgery, contrary to the general impression, is no exception. Indeed, Tagliacotius, one of the sequence of "fathers of plastic surgery", had at one time no less than twelve German counts, nineteen French marquises and one hundred Spanish cavaliers, as well as an English squire, under his care for reconstruction of noses which had been lopped off by sabre blows. On the other hand, there is no doubt that giant steps forward have been made in this specialty as a result of the past two World Wars, due in part to new instruments and also to new therapeutic agents. But what of the surgeon himself? What personal talents, what background of experience and training are to be desired in a surgeon devoting himself exclusively to this exacting surgical specialty? What were the methods of training in the past, and what plan would seem to be most desirable for the future?

Prior to and following World War I, training in plastic surgery was provided mainly by the apprentice system; some of these were too long and some were too short. In addition, a limited number of residencies in hospitals were available, and postgraduate courses were held in various countries. In few, if any, of these was an adequate test made of the student's ability. In fact, it was not until the organization of the American Board of Plastic Surgery in 1938 that a means of evaluating both the theoretical knowledge and operative skill of the candidate was instituted. As a result of World War II, there has been a far greater resurgence of interest in plastic surgery than was evident after 1918. This is probably due to the early institution of plastic surgery centres by many of the combatant nations. The men who were attached to these units received invaluable experience in the treatment of burns and all varieties of traumatic wounds. However, little, if any, opportunity was provided for training in civilian type plastic surgery, which emphasizes the treatment of congenital and cosmetic defects. In England, plastic surgery has not yet been included among those specialities for which a Fellowship is granted by the Royal Colleges of England and Edinburgh, although there are indications that such a move is contemplated. The need for an index of qualification in Canada was recognized by the Royal College of Physicians and Surgeons in 1947 with the advent of certification in plastic surgery. Although this was an achievement in the development of training standards, certain discrepancies exist.

Aptitude.—There are certain personal characteristics which are desirable in the student, and it is of considerable practical importance to suggest that before embarking on a long and arduous course of training he should undergo a period of self-analysis with reference to determination, manual dexterity, academic grades and interest in surgery. He will be wise to discuss the pros and cons of his particular circumstances with someone of recognized standing in this field. The preparation and presentation of a brief *curriculum vitæ* beforehand will aid the adviser in reaching a conclusion. As has been noted many times before, those students whose major reason for specializing is the greater financial reward, may quite safely be categorized as being among those least likely to assist in the advancement of that specialty. The basic quality is one of artistic imagination or the faculty of being able to visualize the various stages and their proper sequence from beginning to end of a given procedure. Not infrequently a young surgeon is attracted to this specialty because of his pleasure in executing meticulous closure of wounds. While the possession or de-

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velopment of surgically-gentle hands is important, as well as unending patience, these are but the means by which the mentally-visualized, completed repair of a complicated deformity may be carried out.

Diagnosis of displaced parts which, when restored to original positions, greatly simplify the reconstruction, judgment of the maximum amount of traumatized tissue which may be safely conserved: all these may be learned by the study of texts of general principles of plastic surgery written by a host of predecessors, and by clinical experience. The ability to select the most suitable surgical procedure for a given case, from the many described, derives from the length of experience in the operating theatre. These qualities may be gained in direct ratio to the diligence of study, intellectual capacity of the individual, careful study of surgical technique and the number of patients treated.

The surgeon must also have the courage to face occasional failure when some unexpected or unavoidable complication has necessitated a fresh start. With determined equanimity, alternative plans must be immediately formulated and the patient's disappointment supplanted by the confident hope that a successful result will be obtained. The ability to inspire enthusiasm will often spell the difference between an incomplete or a complete reconstruction, and in some instances, as in patients suffering from extensive third-degree burns, it would almost appear to be the stimulus to survive. The surgeon must have some knowledge of the rudiments of psychiatric diagnosis and therapy. A very considerable number of patients who request the treatment of various congenital or cosmetic defects suffer also from inferiority complexes or psychoneuroses. These individuals require not only plastic surgery but a fair measure of psychotherapy during the postoperative period. Frank psychotics should be detected, if possible prior to operation, and referred to a psychiatrist for treatment, and in the event of postoperative development of symptoms, immediate consultation should be obtained.

Training.—What special subjects should the period of postgraduate training include? Following the year of rotating internship, which should include six months in medicine, a minimum of four years should be spent in surgical training. The first year in surgery should be devoted to general surgery and the second year divided between a number of the surgical specialties such as orthopædics, neurosurgery, oral surgery, otolaryngology and ophthalmology, depending upon the previous training of the student and the availability of these specialties at the hospital in question. Of the various subspecialties, some training in a large oral surgery clinic will be most profitable, since experience will be provided in not only the various pathological conditions involving the mouth and jaws but also in the treatment of fractures of facial bones. During this time experience may be gained in the methods of construction of prostheses which are occasionally required in the mouth and about the face to restore the very large defects after radical removal of extensive carcinoma.

The fourth and fifth years of postgraduate work should be spent as an assistant resident and then as a resident under the direction of an accredited plastic surgeon. The entire period should be devoted to this specialty and the service should include all types of general plastic surgery of *children* as well as of adults. Throughout the planned residency, positions of increasing responsibility should be held with adequate supervision, so that accurate clinical diagnosis and surgical skill will be acquired on completion of the course. It should be tacitly agreed, however, that the quality of work done should be appraised as well as the specific time spent in a hospital. Those men who hope to be associated with teaching hospitals and universities should spend some time during their postgraduate training in full- or part-time research. For others it is desirable but not mandatory. So much basic research is required in this specialty, so many problems are unsolved, that not only is the discipline imposed by this endeavour desirable in creating a well-developed instructor, but it is the duty of medical schools and teaching hospitals to foster research and clinical investigation.

Examination.—The resident system probably originated about the fourth decade of the nineteenth century in Australia and Germany. Shortly before 1900, Halstead introduced a somewhat similar residency system which has gained increasing popularity since then and has largely replaced the preceptor training. Many years ago, under the apprentice system, the period of indentureship, whether long or short,

was terminated without any formal review of the knowledge gained by the student, and in general the same was true of the residency training. However, with the advent of the American Board of Plastic Surgery in 1938, and certification by the Royal College of Physicians and Surgeons of Canada, an excellent means of evaluating the product of training is provided.

The examinations should include the basic sciences as well as questions relating to the specialty of plastic surgery itself. They should be written, oral and, for obvious reasons, operative. In no other surgical specialty are the successes less conspicuous or the failure more obvious, and there is no doubt that the final accolade should be reserved until both operations and operative cases have been observed and evaluated. In regard to the failures, the defects sometimes resist further attempts to improve their appearance, and haunt the surgeon or his colleagues for years. Because of the conspicuousness of the majority of procedures in plastic surgery and the diverse qualities which are required, it is obvious that the training of a plastic surgeon should be rigorous and the proficiency tests rigid. Thus, the standards both within the specialty and in relation to other specialties will be maintained in high regard.

PARTIAL CHOLECYSTECTOMY

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IT is always desirable to remove the diseased gall bladder completely, with careful ligature of the cystic duct and artery. Occasionally upon opening the abdomen the surgeon encounters a gall bladder which is densely adherent to the liver; the organ may be either acutely or chronically inflamed and the structures at the hilum bound together by dense adhesions, the result of an inflammatory process. The cystic duct, which normally has a short, tortuous course, may be so firmly adherent to the adjacent common duct that Hartmann's pouch sits directly upon the latter.

Dissection of the separate components is exceedingly difficult in such cases, and adding to the difficulties the gall bladder may be very friable. The danger of injuring the common or right hepatic duct or of ligating in error one of the hepatic arteries is very real. Many instances of postcholecystectomy jaundice and stricture or division of the common duct must owe their occurrence to such a set of circumstances. It is even possible that extensive dissection in this area may, in rare instances, result later in inflammatory stricture of the common duct though the latter has not been directly injured at operation.

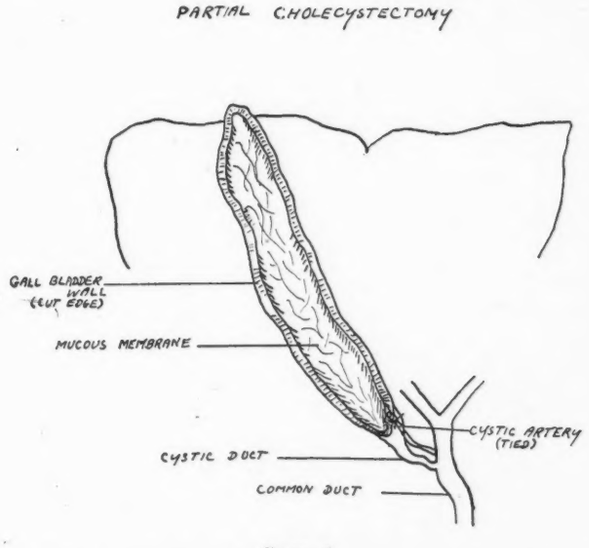
In such cases I have adopted a procedure which falls short of the ideal of complete removal of the gall bladder with ligation of the cystic duct; nevertheless the results have been completely satisfactory.

Technique.—The abdomen is opened through a conventional upper right paramedian incision and the usual exploration of abdominal organs carried out. The common duct is sought out and a decision reached as to whether opening of this structure will be necessary. The exact situation of the common duct must be kept in mind throughout the operation. Next one usually attempts to define the cystic duct and artery, but in the type of case we are considering this proves exceedingly difficult; possibly the friable gall bladder will tear when it is picked up by forceps. One then boldly cuts through the wall of the gall bladder at the fundus, aspirating the fluid contents. The field is carefully walled off with gauze sponges. Keeping fairly close to the attachment of the gall bladder to the liver, the wall of the gall bladder is cut on each side of the attachment down toward the cystic duct. Bleeding vessels are picked up together with the cut edge of the gall bladder. The cystic artery will be cut across as one approaches the duct; it is easily caught together with the cut edge of the gall bladder wall, transfixed and tied. In this manner three-fourths or more of the circumference of the gall bladder is removed, leaving a portion of the wall with its mucosa attached to the liver. This mucosa is not electrocoagulated. It is not necessary to define exactly the opening of the cystic duct and no attempt is made to tie off the duct. As much as possible of Hartmann's pouch should be removed with the gall bladder. All stones and debris must be scooped out and none left behind. A soft rubber (Penrose) drain about one inch wide is placed down to the cystic duct and the ab-

domen closed. If stones are present in the common duct, these may be dealt with in the usual manner and a T tube inserted.

Postoperative care.—The soft rubber drain is not disturbed for eight days. It is then gradually shortened until the twelfth to fourteenth day when it is completely removed. During this time there may be copious drainage of bile from the open cystic duct, but this ceases soon after removal of the drain provided that there is free flow through the common duct.

The postoperative course is quite smooth and patients may be up a day or two following operation. I have found the late results in no way inferior to those following complete cholecystectomy. Two illustrative cases are cited.



CASE 1

E.B., female, aged 51 was admitted to Victoria Hospital, Winnipeg, January 28, 1949. She complained of pain in the right upper quadrant, indigestion, nausea and vomiting during the previous two months. She had been constipated all winter. On January 23, the pain became extreme, radiating to the inferior angle of the right scapula and she became slightly jaundiced a day later.

On admission her temperature was 101.0°, pulse 90 and she was in great distress. No jaundice was noted. The abdomen was obese, respiratory movements of the abdominal wall limited and very marked tenderness and rigidity were present over the right upper quadrant. The urine was negative for bile and the icterus index 13. The white blood cell count was 9,350 with 50% polymorphonuclears; sedimentation rate was 80 mm. in 1 hour. X-rays were taken January 29 and the gall bladder did not visualize by Graham's method.

A diagnosis of acute cholecystitis was made and the patient treated conservatively with bed rest, antibiotics, fomentations, intravenous injections, etc., for a period of several days. She improved considerably and on February 7, operation was done.

Under gas anæsthesia the abdomen was opened through a right upper paramedian incision. The gall bladder was bright red and tense, with several necrotic areas. The organ was surrounded by dense omental adhesions. These were separated and the common duct reached. The duct was of normal calibre and no stones were palpated in it. A needle was inserted into the duct and normal bile aspirated. It was decided not to open it. The structures at the neck of the gall bladder were bound together in a dense, reddened œdematous mass adjacent to the common duct. The gall bladder was densely adherent to the liver. Upon picking up the gall bladder with forceps, the latter tore, spilling a muddy fluid with many cholesterol stones. The area was carefully packed off, the fundus of the gall bladder cut through and the wall cut with scissors on either side of the liver attachment down toward the cystic duct. Multiple cholesterol stones were removed. The cystic artery was cut across, picked up together with a portion of the gall bladder wall, transfixed and tied. The cystic duct was not dissected out or tied. After all calculi were scooped out, a large soft rubber drain was passed down to the open neck of the gall bladder and the abdomen closed.

Postoperatively this patient's temperature never rose above 100°. Gastric suction was not required. A fairly copious discharge of bile commenced on the second postoperative day, necessitating a change of dressings twice daily. Beginning the 8th postoperative day the drain was gradually shortened till the 14th day when it was finally removed. Three days later there was no further discharge. Sutures were removed on the 12th postoperative day and the patient discharged from hospital on the 14th day. She has remained well since, with no abdominal complaints.

CASE 2

R.M., female, married, aged 35, reported August 10, 1949. She had been a displaced person in Germany, spending several years in concentration camps. For the past eight years she had suffered repeated attacks of biliary colic, receiving no treatment. She stated that during the past three months epigastric pain had become almost constant and that ingestion of any food greatly aggravated the pain. She had lost eight pounds in three months.

The patient appeared ill; no icterus was present; temperature and pulse rate were normal. Exquisite tenderness was present in the epigastrium and beneath the right costal margin. The gall bladder did not visualize by Graham's method. She was admitted to St. Joseph's Hospital, Winnipeg and operation was done August 20.

The abdomen was opened through an upper right paramedian incision. The gall bladder was buried beneath the stomach, which, together with great omentum, was adherent over it. Separation of some dense adhesions revealed the presence of a fistula between the gall bladder and stomach. This was divided and the gastric wall inverted and closed. With further division of adhesions the gall bladder, red and gangrenous in places, was exposed down to the common duct. The duct was not dilated, no stones were palpable in it and needle aspiration yielded a good flow of normal bile. The duct was not opened. Attempts to dissect out the cystic duct were futile, the gall bladder wall tearing wherever forceps were applied to it. The structures at the hilum were bound together in dense adhesions and the gall bladder was similarly bound to the liver. Partial cholecystectomy was then carried out in exactly the manner described above. All stones were carefully removed. No further attempt was made to define or tie the cystic duct. The appendix was removed, a large soft rubber drain placed at the neck of the gall bladder, and the abdomen closed.

Immediately after operation a transfusion of 500 c.c. of citrated blood was given. Postoperative care followed routine lines, with intravenous fluids, vitamins, antibiotics, sedatives and respiratory exercises. A greenish purulent discharge commenced the day after operation; this discharge was fairly copious and dressings were changed several times daily. The patient was out of bed on the third postoperative day. No unusual febrile reaction occurred. On the tenth postoperative day

sutures and drain were removed. The patient was allowed to go home September 3. The discharge rapidly lessened and had ceased completely by September 7. This patient now complains of very little indigestion and has resumed a liberal diet.

In effect, by this method one achieves the desired results while avoiding the need of a second operation, as is always necessary after cholecystostomy. There is no danger of injuring important ducts and vessels because no dissection has been carried out. Drainage of bile to the exterior for a short period of time is not altogether undesirable in these difficult cases, for if the main flow of bile through the common duct is unimpeded, the fistula quickly closes; whereas, if perchance an obstruction of the common duct has been overlooked, it is much better that the bile have an exit than that obstruction with jaundice occur.

SUMMARY

A method of partial cholecystectomy without ligature of the cystic duct is described. It is suggested that this method be used where dissection of hilar structures proves difficult and hazardous and the gall bladder is densely adherent to the liver. No originality is claimed for the method. By this method one may avoid, in many instances, injury to important ducts and vessels and thereby cut down the incidence of postoperative jaundice, early and late. A second operation will not be necessary and the late results are satisfactory.

RÉSUMÉ

L'auteur décrit une technique de cholecystectomie partielle et en donne les indications. Cette méthode peut être utile lorsque la dissection de la vésicule est difficile et même dangereuse. Elle consiste à laisser la partie de la vésicule qui est adhérente au foie et à ligaturer l'artère cystique sans toucher au canal cystique. Elle remplace avantageusement la cholecystostomie qui nécessite presque toujours une deuxième opération. Les résultats obtenus par l'auteur dans les cas ou il l'a employée ont été satisfaisants.

YVES PRÉVOST

Whatever your occupation may be and however crowded your hours with affairs, do not fail to secure at least a few minutes every day for refreshment of your inner life with a bit of poetry.—Charles Eliot Norton.

Nearly half of the 1,500,000 pounds of iodine used annually in America now comes from oil wells. The iodine is obtained from a brine that comes up with the oil.

THE PLASMA CONCENTRATION OF QUINIDINE AFTER ORAL ADMINISTRATION AND ITS EFFECT ON AURICULAR FIBRILLATION*

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IN 1932 Gold and Modell[1] on the basis of clinical experience suggested that the effects of quinidine "depend to a large degree on a high concentration of quinidine in the blood stream". A reliable quantitative method for the measurement of quinidine in biologic fluids was made available in 1943 by Brodie and Udenfriend.[2] Hiatt[3] then studied the blood concentrations of quinidine following various oral doses of the drug and Delevett and Poindexter[4] followed in detail two cases of paroxysmal tachycardia treated with quinidine. The average results showed that the blood levels fell to 50% of their maximum at eight hours and to almost zero at 24 hours. However, wide variations were encountered both in the disappearance rates and in the maximum levels attained. As Delevett and Poindexter again stressed the dependence of therapeutic efficacy on the blood concentration it seemed worthwhile to re-explore the relationship between dose and blood level and to obtain information concerning the effective blood level in cases of auricular fibrillation. It is the purpose of this paper to present the results of such a study.

METHOD

The quinidine content of plasma, urine and fæces was estimated by the method of Brodie and Udenfriend.[5] In this method the quinidine is extracted from the biological material with ethylene dichloride, the extracts washed with alkali to remove degradation products or metabolites of quinidine, and then shaken with a solution of methyl orange. The quinidine couples with the methyl orange to form a coloured complex which may be estimated photometrically.

This procedure is not specific for quinidine. Any basic organic compound, for example many drugs, will react with methyl orange to form a similar coloured complex. Care was taken to exclude such contaminating medication but the diet was uncontrolled. Blank determinations on normal plasma gave values equivalent to 0.0 to 0.5 mgm./l. of quinidine and varied from day to day in the same individual. Duplicate estimations were run on each specimen and when the values were of the order of 3 to 15 mgm./l. they agreed within 10%.

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The subjects studied were patients on the wards of the Winnipeg General Hospital and the Deer Lodge Veterans' Hospital. They showed no evidence of gastro-intestinal, renal or metabolic disorder. Other factors governing the selection of subjects are mentioned below.

RESULTS

1. *The effect of a single dose on the plasma level.*—Subjects on ambulant ward routine were given a single oral fasting dose of quinidine sulphate and the plasma quinidine concentration was measured at intervals thereafter. The results are recorded in Table I. In this table the subjects are arranged according to the size of dose of quinidine given, from the highest to the lowest. The results show that the maximum plasma concentration occurred two to four hours after the dose. The table also shows that neither the maximum plasma concentration nor the level at any given time was closely related to the size of the dose. For example, subject Ga. given a dose of 15.6 mgm./kgm. had a two hour level of 1.2 mgm./l. and a maximum level of 2.0 mgm./l.; whereas subject Pl. given a dose of 5.0 mgm./kgm. had a two hour level of 2.8 mgm./l. and a maximum level of 2.8 mgm./l. —higher levels than obtained in the other subject given the larger amount of the drug.

Because of the marked differences in plasma level the individual variability was examined. Six subjects were given the same dose of quinidine sulphate on two different occasions and the results are included in Table I and indicated by the numerals 1 and 2 after the name of the subject. It is apparent that although no individual showed entirely consistent responses the differences were less than those which occurred from person to person.

The relationship between dose and plasma level was therefore restudied using intra- rather

TABLE I.

PLASMA QUINIDINE LEVELS AFTER SINGLE ORAL FASTING DOSE IN MGM./LITRE.

Subject	*Weight kgm.*	*Dose mgm./kgm.*	*Time after dose*						
			1 hr.	*2 hr.*	*3 hr.*	*4 hr.*	*6 hr.*	*8 hr.*	*12 hr.*
Ga.	64.0	15.6		1.2		2.0	1.8	1.6	1.2
Pa.	64.5	15.0		2.8		2.0	1.8		
Mi.	51.4	15.0		3.9		2.4	2.0		
St.	64.5	15.0		6.2		6.0	4.9	3.2	
Ca. 1	55.5	14.4		5.1			3.8		
Ca. 2	55.5	14.4		4.8			3.1		
Br. 1	59.0	13.5		3.9			3.9		
Br. 2	59.0	13.5		3.6			3.7		
Al.	76.4	13.0	3.2			2.3	1.8	1.7	
Ha. 1	76.4	13.0				3.8		3.2	
Ha. 2	76.4	13.0				4.3		4.7	
Kn.	55.0	10.9	2.3	3.0	3.5			1.5	2.0
Sw.	57.0	10.5	4.0		2.5			1.5	1.0
Wi.	58.0	10.4	2.3	3.9	4.5		3.1		1.2
Lo.	58.0	10.4	3.0	2.7	3.3	4.0		1.5	1.5
Sk. 1	57.7	10.3			2.8	3.1			
Sk. 2	57.7	10.3			1.6	1.6			
Da. 1	79.5	10.1		3.2			2.6		
Da. 2	79.5	10.1		4.2			3.4		
Pl.	79.0	10.0		2.5		3.0		3.0	
St.	64.5	10.0		2.9		3.6	3.3	2.0	
Mi.	51.4	10.0		2.0		1.0	1.0	1.0	
Pa.	64.5	10.0		1.9		1.8	1.0	1.2	
McD. 1	62.0	9.7		2.2	3.0	3.0		1.5	1.5
McD. 2	62.0	9.7		2.5	4.0	5.0		3.0	1.9
Ba.	68.0	9.0	4.0	3.0	2.0	1.6		1.0	1.4
To.	71.0	8.4	1.3	1.5	2.0	1.9		1.0	0.2
Sm.	73.0	8.2		3.5	4.0	3.0		1.5	1.2
Le.	76.0	7.9	3.0	4.5	6.0	6.0		3.0	2.0
Mo.	76.0	7.9	4.0	4.8	5.0			2.3	2.4
Bo.	76.0	7.9	1.8	1.6	1.6			0.5	0.3
Ke.	78.0	7.7	0.3	2.0	2.3	3.0		1.3	1.3
Ho.	85.0	7.1	1.9	2.1	3.6		2.1	1.0	1.5
Gra.	84.0	7.1	0.7		1.3	1.5		0.5	0.4
Gro.	89.0	6.7	2.0	2.3	3.3	4.0		2.5	2.6
Pl.	79.0	5.0		2.8		2.5	1.1	1.1	
St.	64.5	5.0		1.5		0.9	0.7		
Mi.	51.4	5.0		1.1		0.8	0.8	0.4	
Pa.	64.5	5.0		1.0		0.5	0.5	0.3	
St.	64.5	2.0		0.7		0.8	0.7	0.5	
Mi.	51.4	2.0		0.9		0.8	0.7	0.3	
Pa.	64.5	2.0		1.0		0.6	0.8		

than inter-individual comparisons. Doses of 2 to 15 mgm./kgm. were given to four subjects and the results are shown in Table II. It will be seen that although, in general, a higher plasma level followed a larger dose, there was no strict relationship between the size of the dose and the resulting plasma level or between the increase in the dose and the increase in the plasma level.

2. *The effect of repeated doses on the plasma level.*—The plasma quinidine concentration was measured in subjects who satisfied the previously mentioned criteria but who showed auricular fibrillation without overt cardiac failure. These patients, listed in Table III, received quinidine according to the custom of the various attending physicians. The results are shown in Fig. 1. It will be seen in cases 6, 7B and 8 that doses spaced at 24 hour intervals produced little cumulative effect on the plasma quinidine concentration. Doses of 1 gm. produced peak values between 2.5 and 3.5 mgm./l. In cases 5 and 7A doses of 1 gm. at

TABLE II.

EFFECT OF SIZE OF DOSE ON PLASMA QUINIDINE IN MGM./LITRE.

Subject		*St.*				*Ma.*				*Pa.*				*Pl.*			
Dose mgm./kgm.		*2*	*5*	*10*	*15*	*2*	*5*	*10*	*15*	*2*	*5*	*10*	*15*	*2*	*5*	*10*	*15*
Time in hours	2.....	0.8	1.5	2.9	6.3	0.9	1.1	1.9	3.9	1.0	1.0	1.9	2.8	...	2.8	2.5	...
	4.....	0.8	0.9	3.5	6.0	0.8	0.8	1.0	2.4	0.6	0.5	1.8	2.0	...	2.5	3.0	...
	6.....	0.7	0.7	3.3	4.9	0.7	0.8	1.1	2.0	0.8	0.5	1.0	1.8	...	1.1	2.9	...
	8.....	0.5	1.0	2.0	3.2	0.3	0.4	1.1	2.8	0.8	0.3	1.2	2.2	...	1.1	3.0	...

In an attempt to explain the variability of plasma levels the urinary excretion of quinidine was studied. In 1929 Wedd and Hubbard[6] reported that "in general the quinidine excretion was directly proportional to the urine output". Goodman and Gilman[7] state that the "major part is quickly excreted in the urine, mainly unchanged". The amount of quinidine excreted during the 24 hours following a single oral fasting dose was determined in 10 subjects once and in eight subjects twice. In these 26 observations the percentage of the dose excreted varied from 1 to 30% but was less than 10% in 23 instances. The amount excreted was not related to either the urine volume, the dose or the plasma level attained.

To ascertain whether variations in stool quinidine content might account for the plasma level variability, 24 hour stool specimens were analyzed for quinidine. The 24 hour stool was obtained by giving carmine with the quinidine, and again 24 hours later, and collecting for the analysis the first red-tinged stool and all subsequent stools up to and including the second red stool. Such analyses were made on five subjects after a fasting oral dose of 1 gm. of quinidine sulphate, and showed from 10 to 30 mgm. of quinidine, that is from 1 to 3% of the given dose. Assuming such amounts to represent unabsorbed quinidine, these estimations support the statement of Goodman and Gilman[7] that quinidine is readily absorbed from the gastro-intestinal tract. However, they provide no explanation for the differences in plasma levels.

TABLE III.

CASES OF AURICULAR FIBRILLATION

Case No.	*Sex and age*	*Diagnosis*	*Duration of fibrillation*	*Result*
1	F. 69	Cholecystectomy, fibrillation, 6th P.O. day, no clinical heart disease.	1 day	Normal rhythm
2A	M. 57	Coronary sclerosis, angina.	Unknown	Nil
2B	M. 57	Same, 3 days later	Unknown	Normal rhythm
3	M. 59	Coronary sclerosis.	Unknown	Nil
4	M. 28	Mitral stenosis, compensated.	? 3 months	Normal rhythm
5	M. 58	Mitral stenosis, compensated.	? 2 weeks	Normal rhythm
6	M. 57	Essential hypertension and angina, B.P. 210/116.	Unknown	Nil
7A	M. 53	Coronary sclerosis with mild thyrotoxicosis.	Unknown	Nil
7B	M. 53	Same, 12 days after thyroidectomy.	Unknown	Nil
8	M. 51	Thyrotoxic heart disease.	Unknown	Temporary flutter
9	F. 37	Mitral stenosis, compensated, heart enlarged.	Unknown	Nil
10	F. 51	Coronary sclerosis, mild thyrotoxicosis.	? 1 week	Normal rhythm

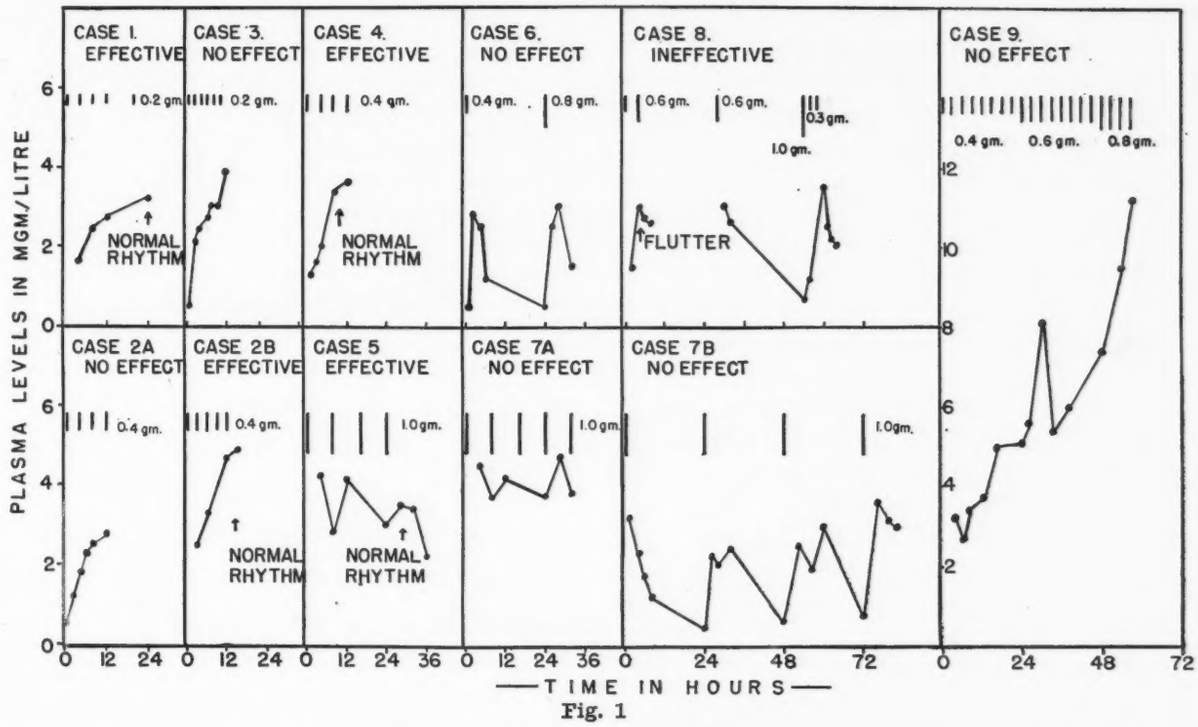

Fig. 1

8 hour intervals yielded an irregularly sustained level between 4 and 5 mgm./l. More frequent doses were employed in cases 1, 2A, 2B, 3, 4, and 9. It will be seen that with doses spaced at four hours or less, the blood levels showed no tendency to fall and there was a smooth rise which in cases 1, 2B, 4 and 9 tended to reach a plateau between 12 and 24 hours. The level of the plateau was roughly related to the size of the dose and its frequency. Thus case 1 with a dose of 0.2 gm. every four hours reached a level of 3 mgm./l.; case 4 with a dose of 0.4 gm. every four hours reached a level of 3.5 mgm./l.; while cases 2B and 9 with a dose of 0.4 gm. every three hours reached a level of 5.0 mgm./l. Doses larger than this were used only in case 9 where 0.6 gm. and 0.8 gm. every three hours produced increasingly high values.

3. *Relationship of plasma quinidine level to therapeutic effect.*—Ten subjects with auricular fibrillation were used to study the relationship between the plasma quinidine concentration and the ability of the drug to restore normal rhythm. In Fig. 1 are shown the plasma levels and therapeutic results in nine of the subjects described previously. Case 10 received 0.2 gm. every four hours for 24 hours and 0.6 gm. every four hours for 16 hours at which time normal rhythm was restored. The plasma quinidine level at 24 hours was 2.7 mgm./l. Subsequent values were not obtained but it is probable that the plasma concentration was over 4 mgm./l. at the time of restoration. Including this case the results consist of 12 trials on 10 patients and normal rhythm ensued in five instances.

Previous clinical experience suggests that case 1 might have reverted without quinidine therapy, leaving four instances where resumption of normal rhythm can be assumed to be a quinidine effect. In these four cases, it will be noted that normal rhythm did not occur until the plasma quinidine concentration was 3.0 mgm./l. or greater. Case 2 is particularly instructive in that on the first occasion no effect was obtained with a plasma level of just under 3 mgm./l. whereas three days later the desired effect was obtained at a plasma level of over 4.6 mgm./l. In case 5 normal rhythm was restored only after the plasma level had been maintained above 3 mgm./l. for 24 hours.

DISCUSSION

These results resemble those of Hiatt[3] and of Delevett and Poindexter[4] regarding the maximum plasma level and its rate of fall after a single oral fasting dose. They also show, as pointed out by the latter authors, that there is no clear correlation between the dose per kgm. and the maximum plasma level attained, or the plasma level attained at any given time. Studies of the quinidine content of 24 hour

specimens of urine and stool failed to account for the observed variations in plasma level following any given dose. Nevertheless, such variations may be caused by differences in rate of absorption which would not be revealed by the final stool content as measured here. If this is the case it would explain why the plasma levels obtained with repeated doses were somewhat more consistent.

In the patients with auricular fibrillation the results suggest that an effect attributable to quinidine does not occur until the plasma quinidine concentration is 3 mgm./l. or higher. Levels of this order were obtained by a dose of 0.4 gm. every three to four hours for 12 hours and in at least one case it appeared important that the level be maintained for 24 hours.

In spite of the voluminous literature on the use of quinidine in auricular fibrillation there remains a marked diversity of opinion regarding the indications and contra-indications for its use, and also concerning the various factors to be considered in attempting to assess whether quinidine therapy will be successful in converting auricular fibrillation to normal rhythm. It appears that this problem can only be settled by giving quinidine an adequate trial in a large series of cases. The results suggest that an adequate trial should consist of 0.4 gm. every three to four hours, to be increased by 0.2 gm. per dose each 24 hours up to tolerance. This is essentially the schedule recommended by Gold.[8]

SUMMARY AND CONCLUSIONS

1. Following the oral ingestion of a single dose of quinidine there was wide variation in the plasma levels obtained in different subjects but in general the maximum level occurred between two and four hours after administration.

2. After such administration only a small proportion of a given dose could be demonstrated in the urine and stool.

3. Repeated doses of the drug at intervals of three or four hours produced well sustained plasma levels. Less frequent doses were associated with fluctuating levels.

4. In 12 trials in 10 cases of auricular fibrillation using various dosage schedules, sustained plasma quinidine levels of 3 mgm./l. or more were obtained in eight instances. In five of the eight normal rhythm was restored. In order to obtain a level of 3 mgm./l. or more quinidine in doses of 0.4 gm. every three to four hours was required.

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THE TREATMENT OF PAIN AND "SPASM" IN POLIOMYELITIS WITH "PRISCOLINE"*

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THE most damaging effect of poliomyelitis is flaccid paralysis. This paralysis is determined by the extent of anterior horn cell destruction as a result of virus invasion of the central nervous system. There is no available therapy that influences the recovery of the anterior horn cell. It is, then, understandable that treatment during the acute and early convalescent stages of the disease has little effect on the ultimate muscle paralysis. Deformities which may develop rapidly can be prevented by proper treatment; in the early stages they are produced by a triad of clinical events, paralysis, muscle sensitivity and "spasm". In the absence of paralysis the latter two symptoms are of little consequence apart from the discomfort to the patient. When paralysis is added there is an inability to overcome the shortening tendencies of the opposing muscles, malposition results (often aggravated by gravity) and tends to persist because the sensitive muscles are resistant to manipulation.

Muscle shortening occurs early in the course of the disease and the term "muscle spasm"

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should be replaced by "hypertonic contracture" introduced by Ranson and Sams[1] in 1928, and supported by Greene[2] and Knapp.[3] If the deforming tendency of hypertonic contracture is allowed to persist, the shortened muscle develops a passive type of contracture not relieved by spinal anæsthesia, and a fixed deformity results. Ranson and Sams proposed the term "myostatic contracture" to this intrinsic, fixed, shortening of muscle. Since the possibility of the development of deformities due to hypertonic contracture in the presence of paralysis has been recognized, many methods of relief have been advocated.

Hot packs.—Hot foments for the affected muscles have had many advocates since first proposed by Lovett[4] in 1914. Packs are applied at a temperature of 130 to 140° F. and are repeated as often as necessary in order to put joints through normal ranges of motion. The truth in regard to the efficacy of hot packing probably lies midway between the views of the advocates who are perhaps enthusiastic in interpreting results, and those who oppose hot packing, who are possibly too critical of this method.[5, 6]

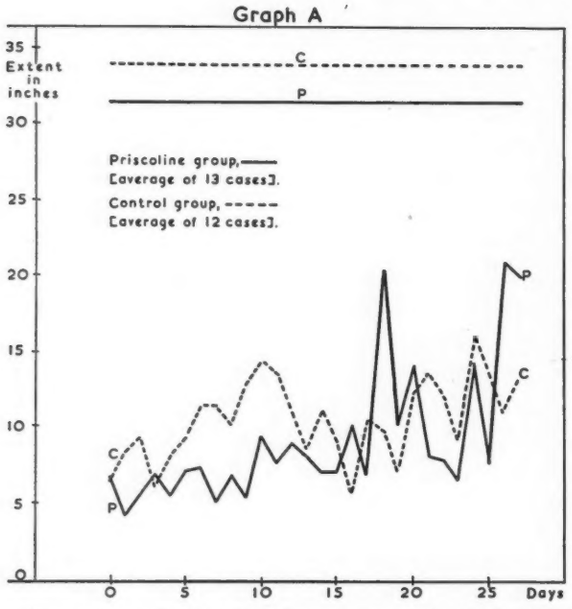
Curarè.—Ransohoff[7] advocated intramuscular injections of curare or intocostrin to make possible more intensive and earlier physical therapy. Curare acts at the myoneural junction in normal muscles, antagonizing the action of acetyl-choline and thereby causes muscular relaxation. In poliomyelitis other factors enter into the causation of hypertonic contracture which are not always affected by curare. Caution has been urged in the use of curare.[8] Recently, Kottke, Teigen, Seigel and Knapp[9] compared the effects on 17 patients of hot foments and intramuscular aqueous curare as adjuvant to muscle stretching, to the effects of stretching alone; neither hot foments nor curare showed any clear cut effect in aiding the return of normal motility. Quinine, atropine and quinidine have somewhat similar effects but have not been thoroughly investigated.

Myanesin.—Schlesinger *et al.*,[10] reported briefly on the use of myanesin in relief of pain and spasm in acute poliomyelitis. They found that the muscles were relaxed by the use of this drug but the demonstrable range of motion was little if any increased, and pain appeared at the point where stretching of the spinal elements took place.

Priscoline.—Smith *et al.*[11, 12, 13] found definite histopathological changes in the sympathetic ganglia in two fatal cases of poliomyelitis and concluded that involvement of the sympathetic nervous system in poliomyelitis might account for vasospasm in the acute stages. The resulting ischæmia may be responsible for the muscle pain and hypertonic contracture. They attempted to control this symptom complex by interrupting the reflex cycle with "priscoline", a sympatholytic and adrenolytic agent. Their reports have been enthusiastic, with relief of acute pain in twenty minutes to eight hours and complete relief of pain in from one to fourteen days. These reports led us to give the drug a clinical trial as a simple economical, and practical adjuvant to physical therapy.

Our work was carried out in the summer of 1949, with children in the poliomyelitis wards at the Hospital for Sick Children in Toronto and its country branch at Thistletown. Patients demonstrating paresis and paralysis were selected and divided, at random, into two groups. The children were kept in standard hospital beds on a felt mattress supplemented with either a Bradford frame or a fracture board. Toronto splints were applied to involved limbs, and as far as possible the children were kept in the supine position. Physical therapy was conducted by four trained physiotherapists who attempted to put each joint through a normal range of motion short of producing pain; this joint movement, passive as dictated by paralysis, became assisted, active and active voluntary as improvement occurred. The use of priscoline was carried out as described by Smith. Over five years of age oral therapy was begun, one tablet of 25 mgm. every three hours, increased by one-half tablet each subsequent dose until the flush dose was reached, and then maintained. When the intramuscular preparation was available, the children were started on 25 mgm., every four hours, and increased 12½ mgm. each subsequent dose until permanent flushing was obtained; this was then given by mouth every three hours. Under five years of age therapy was similar, except that each subsequent dose was increased by 6 mgm. The drug was given until flushing was noted to persist for the entire interval between doses; this was considered to be the optimal dosage.

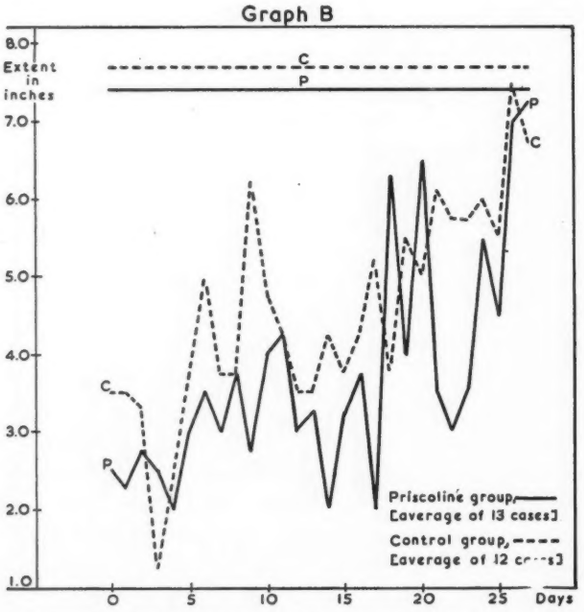
Observations were made on 25 children. Thirteen children between the ages of two and eleven years were placed in a group receiving the drug. A control group consisting of 12 children, ranging in ages from one to fifteen years did not receive the drug. These patients all had typical histories, physical signs and spinal fluid changes of poliomyelitis with spinal paresis or paralysis. Hæmoglobin levels, white blood counts and urinalyses were done on admission and repeated one week after the children had been on the drug. No abnormal variations in either hæmoglobin or white blood cell counts occurred. Three patients showed albuminuria at an early date which disappeared later, in no case did hæmaturia occur. Larger doses caused various symptoms such as nausea, vomiting and diarrhœa. The great difficulty encountered in administering priscoline was maintaining a permanent flush for the full three hour interval between doses. Appearing ten minutes to three-quarters of an hour after oral administration the flush had usually disappeared in from one to one-half hours, and subsequent doses had to be increased. Changes of doses were necessitated



The rate and extent of improvement in back tightness is shown. The upper horizontal lines represent the normal extent in the groups studied.

almost every two or three days; apparently a tolerance to this drug quickly developed.

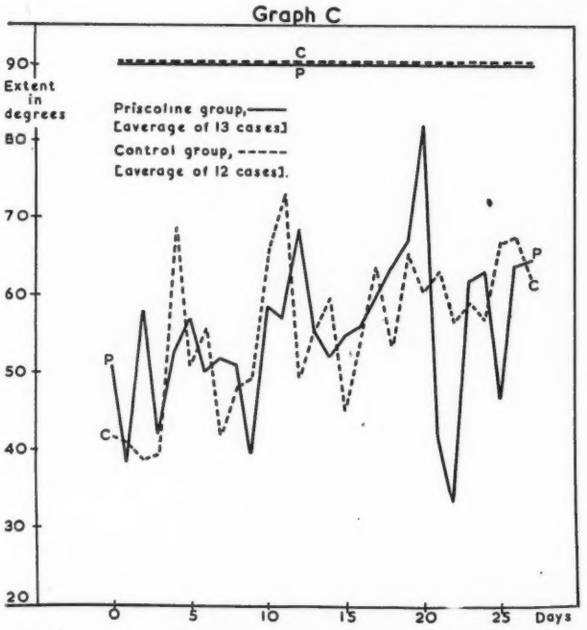
The following measurements made with an inch tape and goniometer were felt to be sufficient for the purpose of attempting a quantitative evaluation of tightness in muscles most commonly affected, hamstrings, neck and back. Hamstring tightness—straight leg raising from the tip of the lateral malleolus to the horizontal level of the bed; neck tightness—length from the hair line of the forehead to the top of the symphysis pubis flexed as compared to the supine position; back tightness—length from the hair line of the forehead to the mid point of the end of the second toe with the foot at a right angle, supine compared with the flexed position.



The rate and extent of improvement in neck stiffness is shown. The upper horizontal lines represent the normal extent in the groups studied.

The accompanying composite graphs A, B and C, summarize the course of regression of the clinical signs of neck, back and hamstring tightness. From these graphs it may be seen there is no appreciable difference in the lessening of neck, back and hamstring tightness in the group of children receiving priscoline as compared with the group of children not receiving the drug.

A follow up study of 30 patients without paresis or paralysis was made to determine the number showing evidence of persisting pain, tenderness or hypertonic contracture. During their hospitalization (of approximately one week) these patients showed varying degrees of neck, back and hamstring tightness. They received regular ward care while in hospital which did not include hot packs or drug therapy. Early physical therapy was instituted but not carried beyond the point of causing pain on active, passive assisted or voluntary movement of joints. These patients were discharged home to bed rest for two weeks after the acute stage of the illness had subsided. Re-examination of these patients was carried out in the Out-Patients Department from 15 to 60 days from the time of onset of the illness, the average was



The rate and extent of improvement in straight leg raising is shown. The upper horizontal lines represent the normal extent of 90°.

29 days; and in all except one case the pain, tenderness, and hypertonic contracture of muscles had completely disappeared.

CONCLUSION

Muscle pain, tenderness and hypertonic contracture in the acute and early convalescent stages of poliomyelitis is a symptom complex of minor consequence in the absence of paralysis. If paralysis is added, this symptom complex becomes more important as a possible factor in producing deformities. From a study of two groups of children demonstrating pain, muscle tenderness and hypertonic contracture with added paralysis as a result of poliomyelitis, we do not feel that priscoline demonstrated any particular value as an adjunct to physical therapy.

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170 St. George Street.

CASE REPORTS

RHEUMATIC PANCARDITIS TREATED WITH CORTISONE*

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Following the initial observations of Hench and others at the Mayo Clinic on the effects of cortisone on the acute phase of rheumatic fever, the opportunity arose to study its effects in a case of extremely severe rheumatic pancarditis.

Mr. B.H., aged 18, gave a history of one attack of rheumatic fever at the age of 8 and a recurrence at the age of 14. He was seen again at the age of 15 and no evidence of cardiac disease was found. He took ill with a cold and sore throat on December 19, 1949, and developed painful swelling in the right knee, both ankles, and toes on December 24, and was admitted to hospital with a temperature of 102°.

During the first week his temperature varied from 99 to 104°, pulse 80 to 120, and blood pressure about 110/60. Swelling, pain, and stiffness occurred at various times in fingers, wrists, and knees, and in both hands and feet. This gradually subsided on salicylates leaving only minimal pain and stiffness. A grade 1 apical systolic murmur increased to a grade IV and a soft aortic diastolic murmur appeared. A pericardial friction rub and gallop rhythm appeared on the seventeenth day of his illness. The neck veins became distended, dullness and fine râles appeared in both bases. Cyanosis of lips and fingers appeared, dyspnœa ensued with a respiratory rate of up to 40 per minute, and the liver became palpable.

Before transfer to the University Hospital January 12, he had received courses of penicillin, aureomycin, chloromycetin, multiple vitamins, vitamin K, digitoxin, thiomerin, and mercuhydrin with little benefit. Sodium salicylates in full doses had given symptomatic relief, but had produced no marked effect on his pyrexia.

On admission January 12, he had become very dyspnœic and showed slight cyanosis. His temperature was 102°, pulse 105, and respirations 40. He was weak and unable to sit up. The neck veins were not distended, and the liver was not palpable. There was no œdema, nor were there any swollen joints, subcutaneous nodules, or skin rashes. There were signs of pneumonic consolidation in the right base, but the patient had no cough or sputum. There were signs of compression at the inferior angle of the left scapula in the form of dullness, bronchial breathing and increased whisper, but no râles were heard. The heart was enlarged to the anterior axillary line. A gallop rhythm was present at the apex and a loud friction rub was audible over the entire precordium partially obscuring a loud grade III apical systolic murmur. A soft aortic diastolic murmur was easily heard as the rub decreased in intensity.

All therapy was stopped for the first three days following admission. Cortisone was started on January 15. He received 2,000 mgm. in the first forty-eight hours in divided doses, 200 mgm. the next day, 100 mgm. daily for the

* The cortisone was supplied for this study by Merck & Company and the National Research Council of Canada in the form of a saline suspension of the acetate.

next six days, and 50 mgm. daily for the last seven days. The large initial dose was given on the suggestion of Dr. Carlyle, Medical Director of Merck & Company.

Clinical observations.—Within 48 hours after cortisone was commenced, his temperature became normal (Fig. 1) and the gallop rhythm and friction rub disappeared. The feeling of well being previously recorded by other authors became manifest. Dyspnœa rapidly subsided and pulse rate fell to about 90/min.

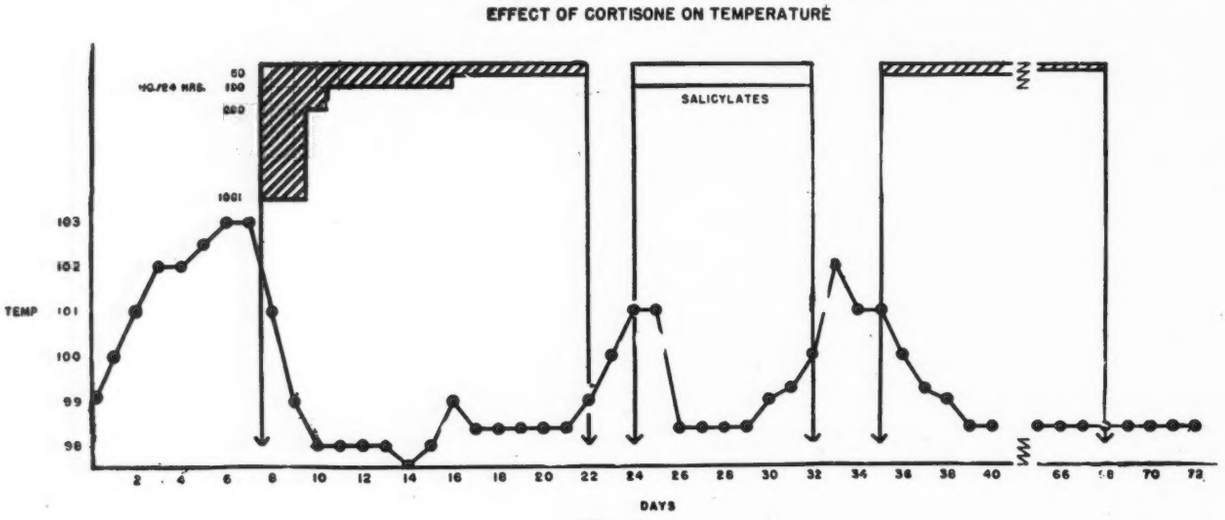

Fig. 1

Bradycardia was not noted, but transient auricular fibrillation appeared on the third day of treatment and lasted for twenty-four hours. It is interesting to note that this occurred at a slow rate of 80/min., which is unusual if due to active carditis. Profuse diaphoresis was noted throughout the course of treatment. This continued during the entire afebrile stage and was much more pronounced than that produced later by full doses of salicylates.

The clinical signs in the lungs cleared rapidly during the first week and marked improvement was noted radiologically in four days. On the tenth day his blood pressure had risen to its peak of 150/90 from initial levels of 110/40, and then fell to normal levels of about 120/80 in the next week.

The patient remained well and in excellent spirits until about twelve hours after the cortisone was discontinued when he first complained of pain and stiffness in the left knee. His temperature rose to 101°, and the next day both the left knee and left wrist had become extremely painful and swollen, with a temperature which rose to 102°.

Sodium salicylate gr. 30 q.i.d. was started on the second day of relapse when his maximum fever had again reached 102°. Twenty-four hours later his temperature had again returned to normal and remained so for about two weeks. While still under salicylate therapy his temperature again rose to 102° and a marked gallop rhythm appeared, but he had no rheumatic pains. The heart began to increase in size. Cortisone was re-started after four days of increasing pyrexia, and again the patient became afebrile in 48 hours—this time on the much smaller dosage of 50 mgm. a day (Fig. 1). The gallop rhythm rapidly subsided again and the heart size decreased (Figs. 2 and 3). He continued on 50 mgm. daily for a further 25 days, during which time he remained afebrile and no significant clinical changes were noted, except that the aortic diastolic murmur was never noted again.

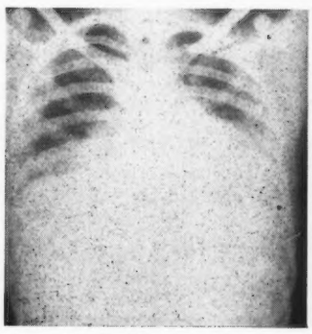

Fig. 2 (Jan. 13)

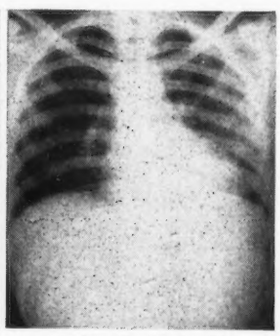

Fig. 3 (Feb. 1)

The dose was then reduced to 25 mgm. for the final eight days, and since termination of therapy he has remained well, and the sedimentation rate has returned to normal. There

is no evidence of aortic incompetence. Moderate acne, hirsutism, and abdominal striæ appeared during the last week of therapy.

Laboratory results. — No significant changes were noted in serial electrocardiograms. The tracing on admission showed evidence of generalized myocardial impairment consistant with severe toxæmia or pericarditis. The classical electrocardiographic changes of pericarditis never developed and the serial records showed few consistent changes. The development of auricular fibrillation on the third day brings up the problem of whether this was a result of the heavy cortisone dosage, or merely represents a phase of his active carditis.

X-ray of the chest prior to treatment showed marked cardiac enlargement with considerable infiltration in the right middle and lower lobes suggestive of pneumonitis. The remaining bronchovascular markings were heavy, probably due to congestion. Two days after treatment was started there was moderate clearing of the infiltration in the right base and some clearing in the right lower chest. A portion of the left diaphragm could be visualized. Four days after treatment was started there was considerable clearing of both lung fields. The heart borders were more clearly defined. Ten days later the x-rays showed only slight enlargement of the heart and the lung fields were clear.

The total eosinophil count showed a dramatic drop within twenty-four hours and remained down as long as the patient remained afebrile and clinically well, but promptly returned to above previous levels on termination of therapy, reaching a maximum of 775 cells per c.mm. (Fig. 4).

The white blood count rose on treatment to 39,000 cells per c.mm. with 93% polymorphonuclear cells. The hæmoglobin and red blood count showed no significant change. The E.S.R. (Cutler) fell from 25 mm./hour to 6 mm. by the tenth day of treatment and again rose rapidly when cortisone was discontinued (Fig. 5). On the second course of therapy, the sedimentation rate gradually fell to normal and remained so.

The blood chlorides showed no significant change. The non-protein nitrogen rose from 25 mgm. % before treatment to 65 mgm. % on the sixth day and then rapidly fell to normal. Unfortunately the determination was not repeated and since the next specimen showed a normal value, there is some doubt as to whether or not this is a laboratory error. A faint trace of sugar appeared in the urine on the fourth to sixth days, and a three hour glucose tolerance test on the seventh day showed the following blood levels: 82, 182, 186, 159, 127, and 101 mgm. % with slight glycosuria.

The glucose tolerance test eight days after therapy was stopped was 78, 156, 116, 89, 115, 98 mgm. % with no glycosuria. The 17-ketosteroids rose from a pre-treatment low of 7.7 to a high of 22.6 on the sixth day, and then fell to pre-treatment levels after cortisone was discontinued. The urinary uric acid creatinine ratio rose from 0.54 before treatment with cortisone to 1.07 after forty-eight hours of treatment, and remained elevated until treatment was tapered off.

An adrenalin test for adrenal insufficiency done four days after completion of treatment and when patient was again febrile showed a drop of only 35%. When repeated seven days

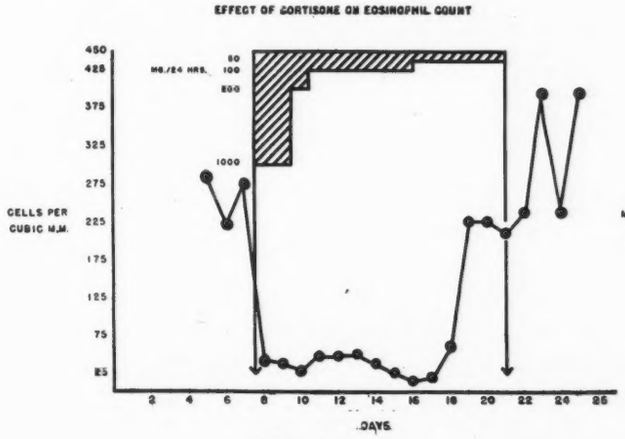

Fig. 4

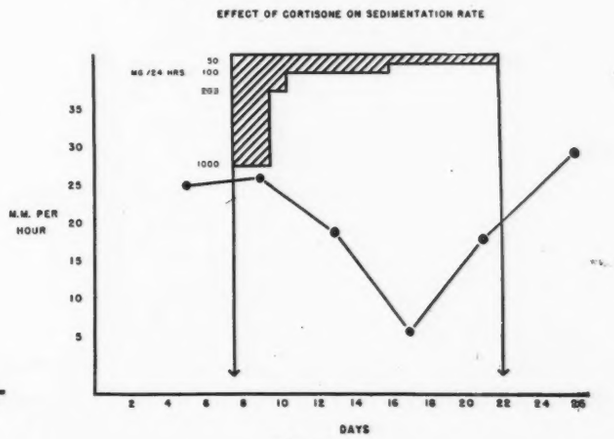

Fig. 5

after treatment, eosinophils rose from 545 to 775, after adrenalin, a rise of 42%.

During the second course of cortisone therapy no significant laboratory changes were noted.

IMPRESSIONS

1. The dramatic, rapid, and beneficial action of cortisone in acute rheumatic fever is confirmed.

2. The total eosinophil count may prove to be a good guide to effective dosage.

3. It is felt the huge initial doses used in this case could be reduced considerably.

4. A longer course of treatment seems advisable in view of the recurrence noted here, and the final success obtained by a further month's therapy.

5. In spite of the massive initial dose (1,000 mgm. daily for two days), no untoward symptoms were noted, although there was a temporary rise in blood pressure and non-protein nitrogen, decreased sugar tolerance, and slight glycosuria. Late in the second course of therapy abdominal striæ, hirsutism, acne, and a rounding of the facial contours appeared, but reverted to normal on termination of therapy.

6. The 17-ketosteroids rose from low normals to above normal levels on treatment. This data may be explained by the fact that some of the cortisone was measured as 17-ketosteroids, as suggested by the group at the Mayo Clinic.

The authors wish to thank Dr. Hugh A. Arnold of Lethbridge, Alberta, for referring this case. Dr. Arnold followed this case in its initial phase and did the follow-up studies after the patient left the University Hospital.

SYNCHRONOUS LYMPHATIC LEUKÆMIA, BRONCHOGENIC CARCINOMA AND HYPERNEPHROMA*

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The relative frequency of double primary malignant tumours and the rarity of synchronous triple malignancies has been stressed in numerous publications. The combination of tumours found in the present case has not been reported and seems to warrant its publication. The usually well founded hesitancy of clinician and radiologist to consider a diagnosis of multiple malignancy and the tendency to relate findings to one etiological basis seems also to justify further reports of this kind.

A 65-year old male was admitted to St. Joseph's Hospital, Toronto, on December 12, 1948, because of hæmoptysis of about 5 weeks' duration. He had had to discontinue work in a foundry 6 years ago because of increasing weakness and has been working since as janitor. In the past two years he lost about 60 lb. in weight; 14 weeks before admission he had to quit work altogether because of a cold. Functional enquiry: marked tiredness, shortness of breath, productive cough and hæmoptysis. Past illnesses: bilateral bronchopneumonia, 1942. Family history not obtained. Physical examination: the patient was a very emaciated white male of Slav extraction. He looked about his stated age. The skin was of pale yellowish colour. The scleræ showed no evidence of jaundice. Numerous enlarged lymph glands could be palpated along the sternomastoids, in the right axilla and both groins. The largest was of the size of a walnut. The glands were discrete and firm. Mouth edentulous. The chest showed marked percussion dullness anteriorly and posteriorly and particularly over the left lower lobe. Vocal and tactile fremitus were decreased. The breath sounds were distant, no râles could be heard. Trachea was in the midline. The heart appeared slightly enlarged to the left. The rhythm was regular, there were no murmurs. Blood pressure 150/85. Abdomen: no rigidity, no masses, no splenic enlargement. Neurological examination negative. Blood examination on admission showed red blood cells 2,550,000, Hb. 48%, white blood cells 25,700. Differential count showed lymphoblasts 4%, large lymphocytes 53%, small lymphocytes 35%, neutrophils 8%. There were 170 smudge cells per 100 cells. The erythrocytes showed marked variation in size with marked central pallor. Platelets showed no marked decrease. Later counts were as high as 40,000 white blood cells with up to 40% lymphoblasts. Urinalysis: albumen trace, sugar negative. Microscopic examination negative. Non-protein nitrogen 88 mgm. %, blood sugar 156 mgm. %. Sternal puncture: blasts 68%, promyelocytes 3%, myelocytes 4.5%, metamyelocytes 2.0%, neutrophils 8.5%, eosinophiles 0.5%, erythroblasts 6.5%, normoblasts 4%, megakaryocytes 0.5%, lymphocytes 2.5%.

X-ray examination showed considerable opacity in the lower half of the left lung field and marked root and trunk markings throughout the left and right upper lung field. Because of the persistence of findings in the left lower lobe a preliminary diagnosis of bronchogenic carcinoma was made; however in view of the hæmatological findings the question of a leukæmic infiltration of the lung was raised. On two occasions a left thoracentesis was performed and about 1,000 c.c. of bloody fluid aspirated. Cell blocks from this material showed no cancer cells. Several sputum examinations were also negative for cancer cells. Bronchoscopy was inadvisable because of the patient's poor condition. On March 12, he died of a terminal bronchopneumonia. Final diagnosis: subacute lymphatic leukæmia, bronchogenic carcinoma ?, bronchopneumonia.

Autopsy findings: both pleural cavities were obliterated by dense adhesions. The left lung weighed 960 grams. The left lower lobe bronchus showed erosion of the mucosa by a granular, greyish white tumour mass, which extended into the surrounding tissue and along the bronchial tree. The latter opened into an irregular shaped cavity measuring about 6 cm. in diameter. This was traversed by blood vessels, which were covered on the outside by tumour tissue. Throughout upper and lower lobe small whitish areas of what appeared to be tumour infiltration could be seen. The right lung weighed 1,080 gm. The lower lobe was covered by a fibrinous exudate and throughout diffuse bronchopneumonic infiltration could be seen. The upper lobe showed also some tumour infiltration. The heart weighed 300 gm. and showed a flabby myocardium and some atheromatous plaques at the base of the mitral valve. The coronaries and aorta showed a mild degree of arteriosclerosis.

The abdominal cavity showed no abnormal findings.

* From the Department of Pathology, St. Joseph's Hospital, Toronto.

There was a retrocolic gastro-enterostomy. The gastro-intestinal tract was otherwise free from changes. The liver weighed 2,000 gm. It showed a tumour mass in the left lobe, which measured 10 cm. in diameter and was greyish white and granular. The centre showed necrosis and liquefaction. The biliary tract showed no abnormal findings.

Each kidney weighed 150 gm. The left contained a cyst at its upper pole measuring 3 cm. in diameter. The right showed at its upper pole a well encapsulated tumour node, which measured 5 cm. in diameter. It was pale yellow in colour with a white centre. The genito-urinary tract was otherwise not remarkable. The lymph nodes of neck, axilla, around the pancreas, along the aorta and in the mesentery were all enlarged. They were discrete, firm greyish white on the cut surface, homogeneous and opaque. The largest measured 6 x 3 x 2 cm. The bronchial nodes showed anthracosis and a few showed infiltration by granular white tumour tissue. Adrenals and pancreas were not remarkable.

Microscopic examination.—The tumour in the left lower bronchus was composed of atypical squamous cells, which showed intercellular bridges and a few mitotic figures. There was little variation in size and staining properties of the cells. Identical tissue was found along the wall of the vessels in the cavity in the left lower lobe. Some hilar lymph nodes and the tumour in the liver showed secondary squamous cell carcinoma. The tumour in the right kidney was composed of pale, vacuolated, almost clear, polyhedral cells. These had a round vesicular nucleus. The cells were arranged along delicate connective tissue septa and showed very little invasive tendency. Mitotic figures were very scanty. The picture was that of a hypernephroma of relatively low grade malignancy. Sections from different lymph glands showed throughout complete obliteration of the normal architecture due to diffuse lymphocytic infiltration.

Anatomical diagnosis.—Lymphatic leukæmia (sub-acute). Bronchogenic squamous cell carcinoma with secondaries to regional lymph nodes and liver. Hypernephroma right kidney. Bronchopneumonia right lower lobe.

COMMENT

A survey of the literature reveals the incidence of multiple primary cancer as fluctuating between 0.33%[1] and 7.8% of all cancer cases. Burke,[2] who reports the latter percentage from a review of 583 cancer cases, has excluded lymphosarcoma, leukæmias, leukosarcoma, Hodgkin's disease and multiple myeloma from his statistics, because of the uncertain classification of these diseases. The divergence of percentage amongst different authors has been well summarized by Gordon[3] in a recent report of a case of triple malignancy. In view of these differences we felt that a record of 103 cancer autopsies performed at this hospital during the period from January, 1940, to March, 1949, might not be significant, but might contribute a number of cases to a necessary large scale survey. During the stated period 3 cases of multiple synchronous malignancy were found: one showing a basal cell

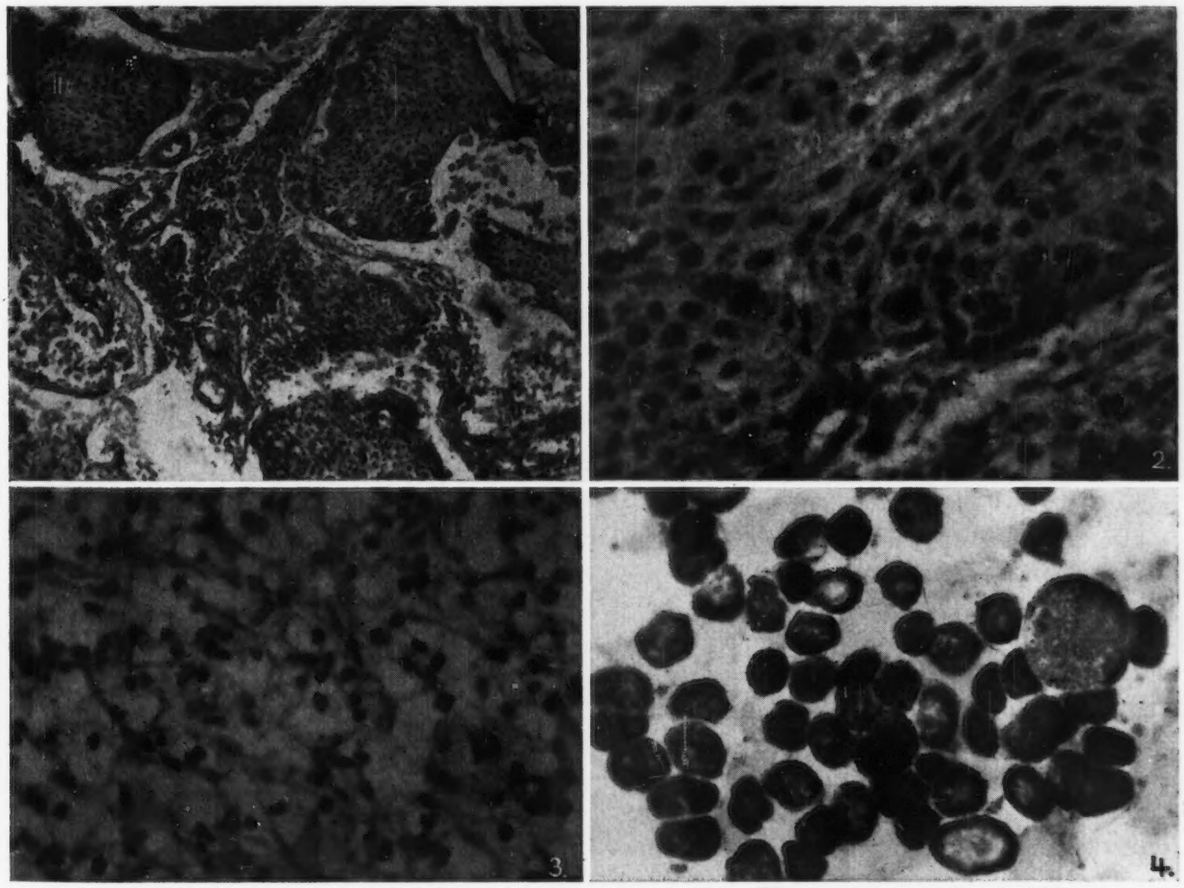

Fig. 1.—Section from left lower lobe bronchus (x 60). **Fig. 2.**—Same section (x 250).
Fig. 3.—Tumour in right kidney (x 250). **Fig. 4.**—Sternal puncture (x 800).

carcinoma of the face and a hypernephroma in a male aged 86, another showing an adenocarcinoma of the head of the pancreas and a malignant hepatoma in a male aged 56, and the present case.

It is a matter of opinion whether to classify this case as a triple malignancy, depending whether leukæmia should be considered a malignant disease or not. However this may be a case of synchronous bronchogenic carcinoma, hypernephroma and lymphatic leukæmia has to the best of our knowledge not been reported. Forkner[4] in his monograph on leukæmia has compiled 29 cases of synchronous leukæmia and malignant tumours from the literature and has added 2 of his own. A breakdown of these cases shows 10 cases of myelogenous leukæmia, chronic and acute, 18 cases of lymphatic leukæmia, 1 case of monocytic leukæmia and two unclassified leukæmias; 3 cases of myelogenous leukæmia and 12 cases of chronic lymphatic leukæmia were associated with lymphosarcoma. More recently Shapiro and Bolker[5] have reported a case of lymphoblastic lymphosarcoma, clear cell carcinoma of the kidney and papillary carcinoma of the colon in a male aged 70. De Wan and Hunter[6] have reported a case of lymphocytic lymphosarcoma, adenocarcinoma of pancreas and liver in a male aged 60. The hæmatological findings in this case make one wonder whether this case is not a borderline one, if not a true case of aleukæmic leukæmia. The autopsy record of the Department of Pathology of the University of Toronto from 1928 to 1949 shows, amongst 8,316 routine autopsies one case of acute lymphoblastic leukæmia synchronous with adenocarcinoma of the transverse colon in a woman aged 51, and a case of acute monocytic leukæmia following a 20-year cure of carcinoma of the breast in a woman of 68. There are also two cases of lymphosarcoma associated with carcinoma of the rectum and lung respectively on record. Schreiner and Wehr[7] found 4 cases of chronic lymphatic leukæmia amongst records of 11,213 cases of malignancy. Hoffman, as quoted by these authors, found 2 cases of myelogenous and one of lymphatic leukæmia associated with malignant tumour. Two cases of bronchogenic carcinoma and chronic lymphatic leukæmia have been reported in the literature, one in a 49-year old male[7] and the other in a woman aged 67.[8]

SUMMARY

A case of synchronous lymphatic leukæmia, clear cell carcinoma of the kidney and bronchogenic squamous cell carcinoma in a 65 year old male has been reported and the pertaining literature been discussed.

I am indebted to Dr. Wm. Magner for verification of the hæmatological and histological findings and to Professor Wm. Boyd for permission to review the records of the Department of Pathology.

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A CASE OF EXOMPHALOS

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One individual surgeon is not likely to gain much experience in this type of case, as exomphalos is reported to occur but once in five to six thousand cases.

Exomphalos is a failure of the second stage of intestinal rotation. The mid-gut or part of the mid-gut remains extruded in the extra embryonic cœlum and fails to return to the abdomen proper. The child is born with loops of intestine protruding through the umbilicus, bound loosely together by mucoid material, and covered by a thin membranous veil which is attached to the skin at the navel. This is a hernia into the umbilical cord or an amniotic hernia. If the condition is untreated the membrane sloughs and the child dies of peritonitis.

This was a male infant born February 24, 1950 at the Immaculata Hospital, Westlock, Alberta; birth weight 5 lb., 4 oz. There was a large hernia into the cord, spherical in shape—the greater part of the sphere being covered only by the amnion. The umbilical cord was spread out to cover approximately one-eighth of the inferior surface of the sphere. Through the transparent amnion we could see the whole abdominal content, which we determined at operation contained stomach, liver, small and large intestines. The infant began to breathe and cry vigorously and this caused the content of the hernia, in its transparent case, to bounce around actively. One could see the air coming into the intestine like the blowing up of a long balloon. I had not seen a case before, so covered the hernia with tulle gras and cotton wool, while seeking information.

In Ian Aird's "Companion in Surgical Studies," I found described just what we had before us. Aird states that unless operation is performed early peritonitis develops. We did not operate until eight hours after birth but the amniotic sac covered in tulle gras had taken no

injury. Open ether anæthesia was given. The opening in the linea alba was about one and one-half inches in diameter, and this would not permit a return of the liver which was elliptical in shape and about three inches in its shortest diameter. The opening was enlarged and the contents of the hernia returned to the abdominal cavity. The closure was affected with difficulty, using through and through silk-worm-gut sutures.

The infant was given a small amount of blood intramuscularly, and glucose and saline in maximum absorbable quantities interstitially. The bowels moved twenty hours after operation. Vomiting stopped; the infant began to retain the mother's milk, and has done well since. The sutures were removed on the 10th day. The child was discharged from hospital on the sixteenth day weighing 6 lb. 2 oz.

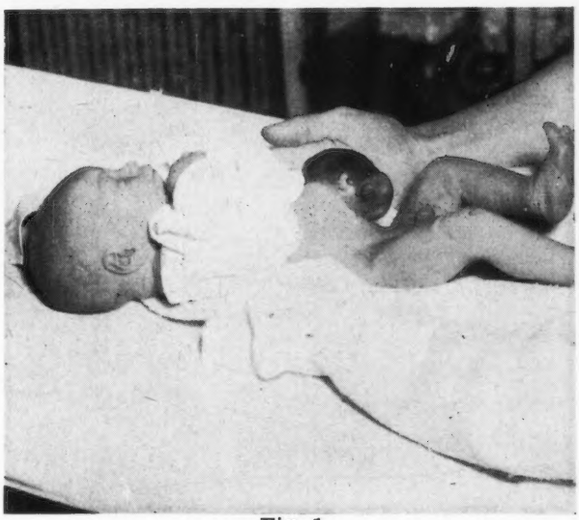

Fig. 1

CONCLUSIONS

I believe that the earlier operation would have the advantage of a more collapsed bowel. However, one must weigh against that the advantage of giving time for full expansion of the lungs before giving an anæsthetic.

Open ether anæsthetic was very satisfactory and well tolerated by the infant.

If the sac had ruptured during birth I believe the operation might be successfully performed immediately, if the intestinal contents were immediately covered in sterile wrappings.

Extremely good nursing care is the most important factor in the postoperative period.

LATENT SILICOSIS*

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This case is of interest because it illustrates the development of silicosis after exposure to silica dust had ceased.

The patient is a white male who enlisted in the army in April, 1940, at the age of 31 years. The family history reveals no exposure to tuberculosis or any other pulmonary disease.

His personal history reveals no serious illness. Prior to enlistment the patient had never been outside of the Province of Quebec. He had been employed as a farmer and handyman. From 1936 until 1940 he worked as a handyman in a plant where there was a small iron foundry and a shop where enamel signs were made. He worked in a shipping room which connected these two work rooms and he was also in and out of both of them. Both of these processes were discontinued in this plant in 1940, and for this reason it is impossible to state just how bad dust conditions were. It is well known, however, that many small foundries used to have dangerous concentrations of silica dust, and the manufacture of enamel signs may also involve exposure to silica dust from sandblasting.

This man was accepted for military service and placed in category A. His enlistment chest film on April 23, 1940, was entirely normal (Fig. 1). The man served as a private in the infantry for four months in Canada and two years in England. He was a prisoner of war in prison camps in Germany from August, 1942, until February, 1945. He was on a forced march from February, 1945, until April, 1945. He was returned to England in May, 1945, and there on April 28, 1945, a radiograph of the chest was made which showed the characteristic picture of silicosis (Fig. 2). The patient had no disabling illnesses and no injuries during his period of military service prior to April, 1945. He was discharged in Montreal in February, 1946.

A cough began about March, 1944, and there was also at the same time some whitish expectoration and pain in the right scapular region. While a prisoner of war he lost 15 lb. Shortness of breath was first noticed on his return to England, approximately at the same time that his first abnormal chest radiograph was made. One wonders if the knowledge that he had pulmonary disease did not call the patient's attention to his breathing as he apparently did not suffer from dyspnœa while on the forced march between February and April, 1945.

In November, 1945, a skin rash was first noticed. A punch biopsy of the skin on March 15, 1947, is reported: "Mild non-specific, non-suppurative dermatitis". The final diagnosis of the skin condition as made by a dermatologist was lupus erythematosus. The skin condition has improved and retrogressed off and on but has never cleared up completely.

Further attempts were made to establish the exact nature of the pulmonary disease. Blood studies revealed a moderately elevated sedimentation rate, a normal white blood cell count, an eosinophilia varying from 3 to 11% and no other abnormalities. Blood Wassermann was negative. Sputum examinations and examinations of the fasting stomach contents showed mostly hæmolytic streptococci. No tubercle bacilli or fungi were found.

Tuberculin tests: Mantoux 1:1,000 was positive on May 28, 1947. On July 31, 1946, the total serum proteins were 8.1%; serum albumin 4.7%; serum globulin 3.4%. A.G. Ratio 1.4. On March 18, 1947, albumin 1.53; globulin 3.21.

On March 19, 1947, a biopsy of an axillary gland was reported: "non-specific, hyperplastic lymphadenitis". Bronchoscopic examination of June 25, 1947, was reported: "non-specific bronchitis".

A lung biopsy was done on July 29, 1948, and the pathologist made the following report: macroscopic—specimen consists of two small irregularly-shaped pieces of soft reddish tissue: microscopic—frozen and ordinary sections show lung tissue in which are found several small nodules, which appear singly or in groups, coalescing to form bigger nodules. These nodules are essentially constituted of layer upon layer of hyaline fibrous tissue avascular and nearly acellular. Around these nodules are found numerous tissue histiocytes containing yellow pigments. Stained for iron, some of these

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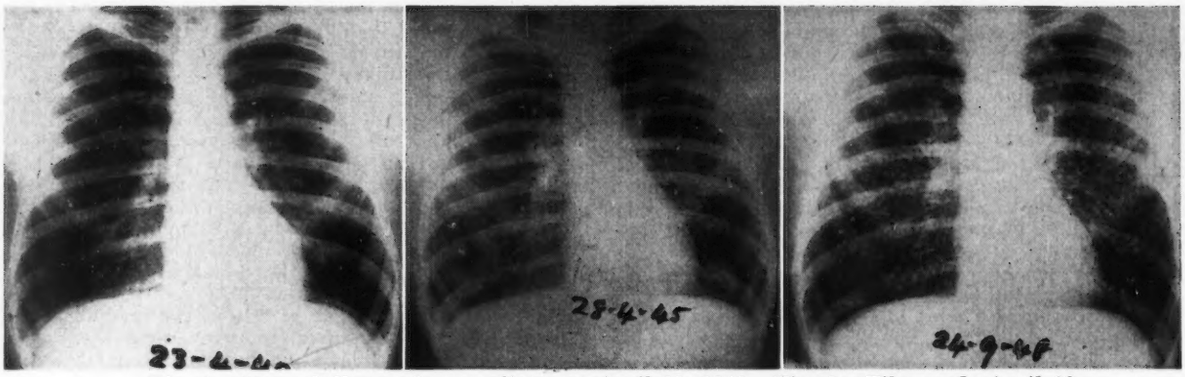

Fig. 1.—Normal film made on enlistment April 23, 1940. **Fig. 2.**—Film made April 28, 1945, showing nodulations suggestive of silicosis. **Fig. 3.**—Film of September 24, 1948, showing progression of the silicosis and one rib removed for lung biopsy.

pigments take a blue colour; most of them remained yellow. Diagnosis: pneumoconiosis.

Spectroscopic analysis of the lung tissue showed tin and aluminum present, iron in an abnormally large quantity, and silica or magnesium silicate.

Patient was last seen on September 29, 1948. He had been working as a carpenter since May, 1948. He had lost no time on account of his lungs but had lost a month with his skin trouble. He still complained of shortness of breath and when asked mentioned cough and expectoration, one ounce daily. His weight remained steady at 123 lb. Physical examination of the lungs was normal and sputum negative for tubercle bacilli on smear and culture. Radiographs May 10, 1946, July 9, 1947, July 25, 1948, and September 24, 1948, show slight progression of the disease (Fig. 3).

DISCUSSION

The question has been raised as to whether this man could have acquired a pneumoconiosis from a powdered chemical fertilizer which he had to spread while he was a prisoner of war. While it has been impossible to determine exactly which material he was using we have obtained reports on the fertilizers in common use in that part of Germany. Some of them contained a certain percentage of silica. From these reports it would have been impossible for this man to have been exposed to a significant amount of silica during this period.

SUMMARY AND CONCLUSIONS

1. A case of silicosis is shown, illustrating the development of radiographic evidence of the disease following a normal chest radiograph at the time of separation from employment.

2. That this is possible is well known by physicians who are familiar with this disease.

3. This case is reported in order to bring this knowledge to the attention of those less familiar with dust diseases.

4. Yearly chest x-rays for several years should follow separation from any employment which involved a significant exposure to silica dust.

5. A workman who leaves such employment should make a claim for possible silicosis prior to the date on which his claim for compensation would become prescribed.

TUBERCULOUS PERICARDITIS TREATED WITH STREPTOMYCIN*

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Tuberculous pericarditis has long been a disease with a high mortality and a grave prognosis. It is a condition that is infrequently seen. The incidence is very low, Norris[1] in a survey of 7,219 autopsies, 1,780 of which were of tuberculous patients, found 82 cases of tuberculous pericarditis, this being 4.6% of the autopsies on tuberculous patients and 1.1% of the total autopsies studied. Bellat and McMillan[2] also reported an incidence of 1.1%.

A review of the literature shows that there have been only 5 cases of tuberculous pericarditis treated with streptomycin. Case 1 reported by McDermott *et al.*[3] was a 19 year old negro girl with rapidly progressing tuberculosis of the hilar lymph nodes who developed a pericardial effusion. Case 2 reported by Meredith *et al.*[4] was a 17 year old negro boy with proved tuberculous nodes in whom pericardial effusion developed which was tapped but no tubercle bacilli were found. The other three cases were reported by Johnson and Bercu.[5] Their first case was a 59 year old white male who developed a pericardial effusion following an attack of

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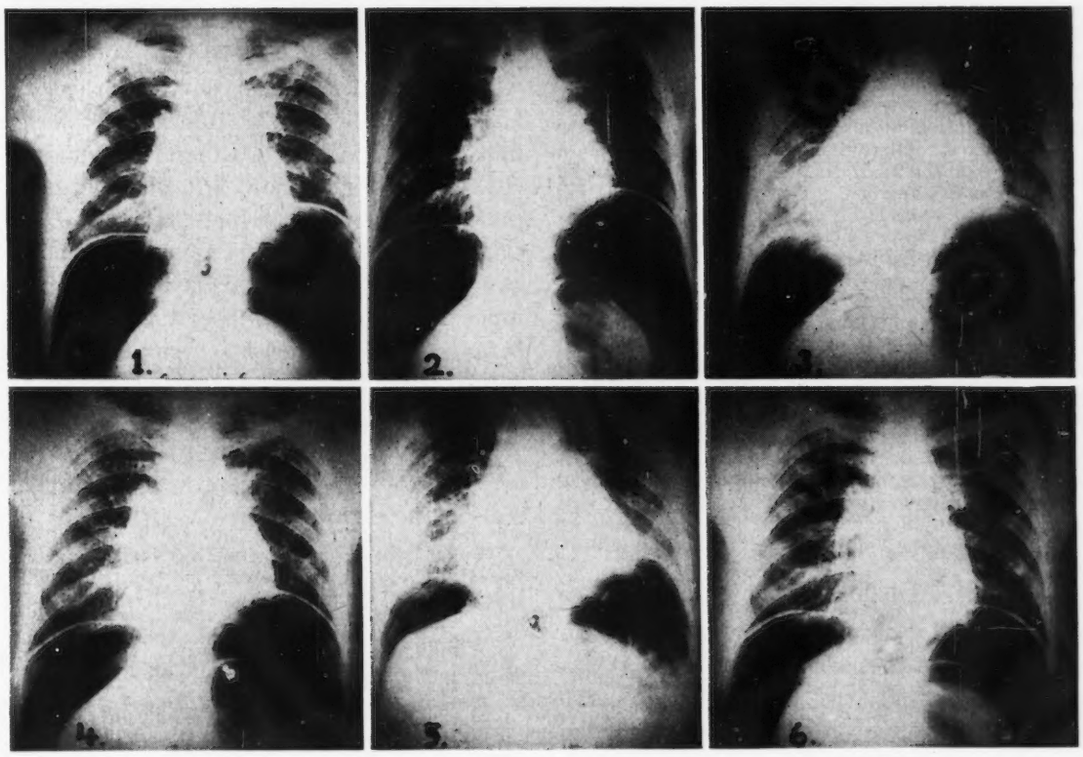
left basal pneumonia, the effusion was tapped and was found positive for tubercle bacilli on culture. Their second case, a 20 year old negro developed an effusion which was tapped on numerous occasions over a period of 10 months and was eventually found positive for tubercle bacilli on culture. The third case was also a young negro, 18 years of age.

In view of the small number of cases of tuberculous pericarditis treated with streptomycin we would like to describe a single case treated at the Mount Sinai Sanatorium. As far as we know ours is the sixth case of tuberculous pericarditis treated with streptomycin to be reported in the literature. It is unique in that it is the only case of tuberculous pericarditis occurring in a far advanced case of pulmonary tuberculosis previously treated with pneumoperitoneum and left phrenic crush. It is also unique in that treatment was instituted within three weeks of the suspected diagnosis of tuberculous pericarditis.

A 27-year old white male was admitted to the Mount Sinai Sanatorium on November 20, 1948, with a history of cough for 2 years, loss of weight for 18 months, night sweats and blood-tinged sputum. The patient never had rheumatic fever, diphtheria, asthma or hay fever. Examination of the heart on admission: the point of maximum impulse was visible in the 5th interspace in the midclavicular line; no thrills palpable; the heart was not enlarged to percussion; on auscultation there were no arrhythmias or irregularities heard and no murmur audible at the valve orifices. Blood pressure 120/75, pulse 75.

The diagnosis on admission was pulmonary tuberculosis, bilateral, far advanced with cavitation, sputum Gaffky 8. After unsuccessful attempts at left and right pneumothorax, pneumoperitoneum was instituted January 19, 1949, and has been continued since. Tomographic series taken March 24, 1949, showed bilateral cavitation, more extensive on the left. A left phrenic crush was recommended.

On May 24, the patient was transferred to the Grace Dart Home Hospital, Montreal, where a left phrenic crush was performed on June 1. The patient continued well until June 10 when a pneumoperitoneum refill was given at the Grace Dart Home Hospital, and an x-ray (Fig. 1) was taken immediately after. The same evening the patient complained of severe pain in the chest and shortness of breath which could not be controlled with sedation. The next morning he felt better. He returned to the Mount Sinai Sanatorium on June 15 where an x-ray was taken on re-admission (Fig. 2). At this time the patient was asymptomatic and there was a definite increase in the silhouette of the heart shadow which now measured 13.5 cm. compared with 10.5 cm. on June 10 (Fig. 1). The patient was in no distress and continued apparently well until July 1 when following a pneumoperitoneum refill he began to complain of pain in the chest and abdomen, his temperature was 100.3° F., pulse 92, respiration 20. July 2, temperature 100.4° F., pulse 96, respiration 24; July 3, temperature 101, pulse 100, respiration 28. The patient at this time complained of severe pain in the left shoulder and was somewhat dyspnœic.



An x-ray was taken July 3 (Fig. 3) postero-anterior in the sitting position. A large pear-shaped heart shadow measuring 17.5 cm. at its widest diameter compared with 13.5 cm. in the film taken June 15 (Fig. 2) and 10.5 cm. on June 10 (Fig. 1). There was loss of the usual contours of the heart. The picture showed a configuration characteristic of a pericardial effusion. Blood study done the same day showed hæmoglobin 12.5 gm. %; white blood cells 5,750; red blood cells 4.89 million; sedimentation rate 34 mm./hr. corrected. Differential count polymorphonuclears 50%, stabs 10%, lymphocytes 25%, monocytes 14%, eosinophiles 1%, basophiles 0. Urinalysis was negative.

Paracentesis of the pericardium was not done for

two reasons: (1) due to the pneumoperitoneum and the left phrenic crush there was an elevation and rotation of the heart and tapping was considered unsafe; (2) the patient showed no real circulatory embarrassment to justify a tapping. In view of the absence of cardiac murmurs, a negative history for rheumatic fever and diphtheria, and advanced pulmonary tuberculosis, the etiology of this effusion was considered to be tuberculous, secondary to the pulmonary tuberculosis. Tapping of the pericardium was rejected in favour of vigorous streptomycin therapy. Dihydrostreptomycin 1 gm. daily was started on July 4 as previous reports have shown encouraging results. That same evening the temperature dropped to 99.3° F., the next morning the temperature was normal. Pulse and respiratory rate gradually decreased to within normal limits in the course of the next 5 days; July 8, sedimentation rate 19 mm./hr. corrected; July 11, the heart shadow by x-ray is 12 cm. at its largest diameter (Fig. 4). The usual contours at the left border of the heart are absent; July 12, sedimentation rate 9 mm./hr. corrected, urine remained clear.

Clinically the patient continued relatively well, his temperature and pulse remained normal and the cardiac outline on x-ray had almost returned to the size of that in the film taken June 10 (Fig. 1), before any enlargement was noticed. August 1, several hours after a refill, the patient again began to complain of pain in the left shoulder and some shortness of breath; temperature 100° F., pulse 132, respiration 32. On examination there was an increase in the cardiac dullness. There was a decrease in the intensity of the heart sounds over the pulmonary, aortic and tricuspid regions. The clinical picture was similar to the last episode of pericarditis which the patient had on July 1.

X-ray (Fig. 5) antero-posterior taken August 4, after 3 days of fever, compared with that of July 11 (Fig. 4) shows a definite increase in the silhouette of the heart shadow now measuring 16.5 cm. at the widest diameter. The impression was recurrence of pericarditis with effusion. Three days from the onset of this attack the patient had again improved so that his temperature and pulse were normal and he was once more asymptomatic. Pneumoperitoneum refills have been continued since then without recurrence of any distressing signs or symptoms. The x-ray taken September 9, (Fig. 6) shows that the contours of the heart have returned to the original size as seen in the film of June 10 (Fig. 1) before the onset of any of the episodes of effusion.

DISCUSSION

The episodes of effusion were on each occasion preceded by a pneumoperitoneum refill. It appears therefore that the recurrence of the effusion may in some way be related to the occlusion of the pericardial lymphatics following refills. Dr. Banyai's[6] opinion is "that this exacerbation following pneumoperitoneum refills may be attributable to a blockage of the draining lymphatics of the pericardium, brought about by the elevation and rotation of the heart by the air injected".

An electrocardiogram taken on August 21 showed: "Rate 120/min. normal rhythm, left axis deviation, P waves normal, P-R interval 0.14 sec., QRS normal, QRS duration 0.08 sec., S-T segments normal, T waves inverted in lead I and in chest leads, low in voltage in lead II, R-T duration 0.24 secs. Impression: tracing is compatible with pericardial effusion and with interference with coronary circulation by pericarditis". An electrocardiogram September 17 showed: "Rate 90/min. normal rhythm, left axis deviation, P waves normal, P-R interval normal 0.16 secs., QRS normal, QRS duration 0.08 secs., S-T segments normal, T waves low in voltage in II and chest leads, but upright, T waves in lead III is diphasic. R-T duration 0.32 secs. Comparison with previous tracing shows quite a reversion towards normality, principally in the return of the T waves to an upright position."

On October 1, the patient was still getting 1 gm. a day of dihydrostreptomycin and showed no signs of pericarditis either clinically or on x-ray. Several specimens of sputum and gastric fasting aspirations were negative for acid fast bacilli on concentration and culture.

SUMMARY

A preliminary report of a not proved but highly probable case of tuberculous pericarditis in a patient with far advanced pulmonary tuberculosis with cavitation, left phrenic crush, and pneumoperitoneum, which responded satisfactorily to streptomycin is presented. There were two episodes of pericarditis with effusion seemingly following pneumoperitoneum refills. On both occasions under streptomycin therapy the temperature returned to normal within 12 to 18 hours with marked improvement on clinical and x-ray examination within 7 days. On the first occasion the sedimentation rate had become normal on the eighth day.

We wish to express our thanks to Dr. M. Aronovitch for taking and interpreting the electrocardiograms.

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PRIMARY SPLENIC NEUTROPENIA WITH RHEUMATOID ARTHRITIS (Felty's Syndrome)

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It has been well known that splenectomy offers a therapeutic cure in essential thrombocytopenia and familial hæmolytic icterus. In the past ten years attention has been drawn to a newly recognized syndrome of splenic neutropenia, cured by splenectomy. Wiseman and Doan[1, 2, 3] pointed out that the same

mechanism of hypersplenism is present in all three conditions with varying emphasis on different blood elements. Some of the reported cases showed suppression of the red blood cells, thrombocytes and/or neutrophiles. Splenectomy is followed by an immediate improvement in these elements in the peripheral blood. The reports did not include Felty's syndrome where the leukopenia and splenomegaly are associated with rheumatoid arthritis.

In 1948 Smith and McCabe[4] reported two cases of neutropenia, splenomegaly and arthritis. In both of their cases splenectomy was followed by an excellent hæmatological response. Holland[5] also reported a case of Felty's syndrome where a very good hæmatological response followed splenectomy. The arthritis was not affected in any of these cases. This suggests that the arthritis is not intimately related to the neutropenia and hypersplenism.

In the suspected case, before splenectomy is undertaken, repeated hæmatologic and sternal marrow studies should be carried out. It is important to rule out aleukæmic leukæmia and aplastic anæmia. Wiseman and Doan stressed the presence of a hyperplastic bone marrow as a prerequisite to splenectomy. However, Smith and McCabe showed a good response in one of their cases with a hypoplastic marrow. The latter pointed out that hyperplasia of the bone marrow may be followed by hypoplasia in the chronic cases. Hattersley[6] stressed that absence of splenomegaly in cases of neutropenia is a contra-indication to splenectomy.

The following case is reported for two reasons: (1) the literature is not yet replete, and (2) had the doubt lingered and splenectomy had been deferred the outcome would have been fatal. The patient subsisted only on "borrowed blood" and without benefit from eighteen blood transfusions.

Miss D., aged 21, gives a history of rheumatoid arthritis involving her hands for the past five years. She had received physiotherapy and salicylates but no chrysotherapy or deep x-ray therapy. She noticed a gradual onset of weakness and bleeding from her gums in April, 1949. Hæmatologic investigations at that time proved that she had a severe anæmia and neutropenia with splenomegaly. She had been hospitalized elsewhere and received intensive antianæmic therapy, pantonucleotides and 18 blood transfusions from April to June, 1949. These were only supportive and the anæmia and neutropenia persisted without change.

She came to us on June 16, critically ill. The striking findings on physical examination were severe pallor, splenomegaly and a severely deforming rheumatoid arthritis of the hands. There was no purpura or any lymphoglandular enlargements. The main point of interest centred in the blood findings (see Tables I and II). Other laboratory tests are referred to in Table III.

TABLE I.

Date	*Hgb.*	*R.B.C.*	*W.B.C.*	*Neutro.*	*Lymph.*	*Eos.*	*Rhabs.*	*Mon.*	*Bas.*	*Retic.*	*Platelets*
		(millions)		%	%	%	%	%	%		
17-6-49	57% (8.8 gm.)	2.97	1,300	0	64	22	3	5	2	12	227,550
20-6-49			1,500	1	47	40	7	3			
22-6-49	49% (7.55 gm.)	2.34	700	0	52	35	10	2			
24-6-49			1,150	2	53	23	10	2	6		
26-6-49	Blood transfusion of 500 c.c. of blood.										
27-6-49			1,200	2	56	25	8	4	1		
28-6-49	Splenectomy										
28-6-49	(6 hr. postoperative)		850	3	38	3	35	8	1		
29-6-49	70% (10.84 gm.)	3.26	2,900	7	21	2	47	8	2		
30-6-49			6,850	13	9	8	60	6	1		
2-7-49			6,400	27	7	16	30	6	5		
4-7-49			9,700	26	11	31	16	7	2		
8-7-49	68% (10.52 gm.)	3.36	5,050	33	31	17	6	4	3		
12-7-49			5,650	39	25	13	9	6	5		
16-7-49	68% (10.52 gm.)	3.12	4,200	32	30	4	23	6	2		
1-8-49	71%	4.12	6,200	41	35	15		9			
8-9-49	71%	4.63	7,500	44	44	3		8	1		
22-10-49	81%		8,400	40	45	2		10	1		

TABLE II.

STERNAL PUNCTURE MARROW EXAMINATION

Hgb	53% (8.20 gm.)	Total nucleated count	69,150		
R.B.C	2,470,000	Pols	0.2%	Eos. Meta	2.4%
C.I.	1.1	Rhabs	12.0%	Eos. Gran	7.6%
Hgb. con.	good	Meta	16.2%	Baso Gran	0.2%
Aniso.	slight.	Gran	10.8%	Monos	1.4%
Macro	0 c.c.	Progran	A-0.4%	Plasma	7.4%
Retics	9.3%	Progran	S-3.8%	Lymphs	7.4%
		Granuloblast	0.6%	Metakaryocyte	20.4%
		Eos. Lob.	3.2%	Karyocyte	6.6%
		Eos. Rhab	2.2%	Prokaryocyte	4.2%

TABLE III.

Blood Wassermann—Doubtful.
Blood sedimentation rate—120 mm./45 min. (Westergren).
Red blood cells fragility—Hæmolysis begins at 0·46% and is complete at 0.34%.
No spheroid cells seen.
Blood uric acid—4.2 mgm. per 100 c.c. serum.
Icterus index—8 units.
Bilirubin—1.35 mgm. per 100 c.c. serum.
Qual. van den Bergh—indirect reaction positive.

There was no response to pyridoxin and intensive anti-anæmic therapy. On the basis of a diagnosis of splenic neutropenia combined with unrelated rheumatoid arthritis, splenectomy was performed on June 28. An almost immediate response was noted (see Table I). There has been no change in the arthritis but she is otherwise well again. The peripheral blood examination continues within normal limits.

SUMMARY

1. A case of splenic neutropenia with rheumatoid arthritis (Felty's syndrome) is reported. Splenectomy effected a cure of the blood dyscrasia.

2. There was no response to intensive anti-anæmic therapy.

3. The peripheral blood and sternal marrow findings corresponded to previously reported cases of splenic neutropenia.

4. The rheumatoid state remained static.

We wish to thank Dr. D. F. Moore for conducting the hæmatological tests, and Dr. F. E. Wait for performing the splenectomy.

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SPECIAL ARTICLE

AN OUTLINE OF IRON METABOLISM

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The total amount of iron in the normal human body is calculated to be approximately four grams. This can be subdivided into hæmoglobin, which accounts for 3 gm., myoglobin 0.2 gm., storage iron about 0.6 gm., and the iron in serum and respiratory enzymes, a few milligrams each. The following outline is an attempt to trace the methods by which the body handles iron that is present in the food.

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Digestion.—There is a species difference in the availability of food iron. Thus while dogs are able to absorb either valence equally well, man absorbs only ferrous ions effectively. Moore, using radioactive tracer, showed that the ferric ion was absorbed only 20% as rapidly as the ferrous. The average diet provides iron chiefly as colloidal ferric hydroxide in the foodstuffs. In the presence of normal gastric juice this is broken down to monomolecularly dispersed ferric hydroxide. These molecules are then reduced to the ferrous state by ascorbic acid and the sulfhydryl containing proteins. These reducing agents are only active in an acid medium. The importance of normal gastric acidity is clinically apparent in the poor response to iron therapy shown by patients under treatment with antacids. It is also interesting to note the close association of achlorhydria with the syndrome of hypochromic anæmia.

Elevejem has shown that a high calcium-phosphorus ratio inhibits iron absorption in rats. The feeding of vitamin D improved iron storage in the presence of optimal amounts of calcium and phosphorus, but this effect was not apparent with excess calcium. Finch and co-workers recently showed that rats on a diet deficient in phosphates absorbed very large amounts of iron as compared with controls. Addition of phosphates produced a significant reduction in iron absorption. It is quite possible that the increase of these minerals in the gut in cases of cœliac disease and renal hyperparathyroidism, may account for the hypochromic anæmia often present in these conditions.

Absorption.—Balance studies have shown that loading the body with large quantities of iron will not increase the minute amount normally excreted. Since the total amount of body iron seems to be constantly small, there must be some method for limiting absorption. This controlling mechanism resides within the mucosal cells of the upper part of the small intestine. The mucosal block is closely associated with the appearance of ferritin in the epithelial cells. Ferritin is a crystallizable iron-protein complex in which the iron is chemically identical with ferric hydroxide, but differs from it magnetically. Granick suggests that the ferric hydroxide present in ferritin is polymerized to form clumps which are caught between the protein molecules. After the removal of the iron, the protein forms the same crystals and is called apoferritin, which has also been identified as the vasodepressor material (V.D.M.) When iron is fed by mouth, a high concentration of ferritin and apoferritin rapidly appears in the intestinal mucosa. With repeated feedings at short intervals, the percentage absorbed from the first dose is higher than from the later ones. This resistance to absorption passes off slowly over several days, during which time the ferritin disappears from

the mucosal cells. It would seem reasonable to suppose that this block would be regulated by the body's need for iron. However, Moore has shown that excess iron is absorbed in practically all cases of anæmia, even those in which the body already has an excess of iron. The increased absorption may not be readily apparent. Thus, when cases of pernicious anæmia in relapse were given a single oral dose of radioactive iron, none appeared at first in the peripheral blood. Following treatment with liver, however, there was a gradual increase until as much as 20% of the dose could be accounted for. This is double the amount found in healthy people.

To explain the relationship of anæmia to increased iron absorption, Granick suggested that there are two factors involved. These are the ferritin block, and the balance between the oxidizing and reducing enzymes within the mucosal cell. Normally, as the ferrous ions enter the cell from the bowel, they are oxidized to the ferric state, and combine with the protein apoferritin, to form ferritin. Then as the body needs iron, the reducing enzymes react with the ferritin to liberate ferrous ions, which enter the blood stream. In the presence of anæmia there is a lowered oxygen tension in the mucosal cell which causes the reducing enzymes to become dominant. The resultant liberation of ferrous ions which pass into the blood stream, reduces the concentration of ferritin in the mucosa. This constant lowering of the block allows a speedup in the movement of iron across the cell from gut to blood stream.

In hæmochromatosis, the excess iron absorption occurs in the absence of anæmia. Granick has shown that the ferritin concentration is normal in this condition, and suggests that the defect is probably a congenital one in which the redox balance of the mucosal cell is disturbed.

Transport.—Iron transport is a function of the serum proteins. As the ferrous ion enters the circulation it is changed to the ferric state and bound to a globulin. Normally only one-third of the available protein is bound. Free iron is toxic and when large doses are injected symptoms of nausea, flushing, and headache appear immediately. The excess disappears from the blood stream within five minutes. The serum iron maintains a very constant level and is in equilibrium with the tissue iron stores. Within one hour of injecting radioactive iron, 50% has disappeared from the circulation, and much of it appears as liver ferritin. Far more injected radioactive iron appears in circulating erythrocytes than could be accounted for if storage iron were equally available. Normal persons will have 70% of the tracer dose in their erythrocytes within eighteen days. However, it has been shown that when blood is incubated *in vitro* with radioactive iron, the reticulocytes will take up the metal, but the adult erythrocytes will not. Thus, although transport iron is more available than storage iron, its appearance in the erythrocytes depends on the activity of the bone marrow.

The mechanism of the anæmia of infection has been investigated in a series of experiments carried out in Wintrobe's laboratory. It was found that with the onset of an acute infection, the level of serum iron falls rapidly. If the infection does not clear up, the level continues low and, with the onset of chronicity, anæmia becomes apparent. Intravenous curves demonstrated that iron is removed from the circulation more rapidly than normal. Attempts to raise the level, even by continuous intravenous injection, were ineffective. The uptake of injected radioactive iron by the erythrocytes was markedly inhibited in the presence of infection. Radioactive iron was given to animals with localized infections, and only relatively minute amounts were taken up by the inflamed tissues. In the infected group, the liver was found to contain the majority of the injected iron, while in the normal controls this was found chiefly in the blood. The low serum iron is associated with a marked reduction in the quality of iron binding protein in the serum. Thus in the presence of infection more iron is diverted to the usual storage depots than usual, and there is also some failure in erythropoiesis. The anæmia will not respond to any treatment except removal of the infection.

Storage.—In man iron is stored chiefly in the liver. The nature of storage iron is still not entirely clear. A large portion is simply ferritin. An increase in liver ferritin has been demonstrated after injecting tagged iron. The same increase was found after transfusing dogs with tagged erythrocytes, and then treating them with phenyldydrozine. Ferritin iron, however, is so diffusely dispersed that it does not stain in microscopic sections. The microscopically visible form of tissue storage is called hæmosiderin. Granick has shown that hæmosiderin granules contain clusters of ferric hydroxide mixed with protein. The granules may contain as much as 35% iron which has the same magnetic properties as ferritin iron. He suggests that hæmosiderin simply consists of polymerized ferritin. In many cases the amount of invisible storage iron present as ferritin may be considerably greater than the microscopically visible hæmosiderin.

Excretion.—The kidney is not normally involved in iron metabolism. However, if hæmoglobin in the serum reaches a level of 100 mgm. %, then the hæmoglobin appears in the urine. In some cases of chronic hæmolytic anæmia, iron is found in the epithelial cells of the urinary sediment (prussian blue reaction). Hampton and Myerson have demonstrated the appearance of ferritin in the kidneys of mice and rabbits following experimental hæmoglobinuria.

The established concept that there is only negligible excretion of iron has recently been challenged by Mitchell and Hamilton. Using healthy males, they found that the sweat was the route of excretion for a relatively large amount of iron. The concentration of the metal was independent of the rate of sweating. Thus the daily dermal loss of iron under minimal sweating conditions amounted to 6.5 mgm. With severe sweating the loss was three to ten times the basal level. This represents the removal of 65 mgm. a day, which is four times the theoretical intake. If this work is confirmed, it indicates that the mucosal "thermostat" controlling iron absorption is set higher than was previously thought. However, the turnover of iron between the body and its environment would still be very limited.

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CLINICAL and LABORATORY NOTES

PROSTIGMINE VAGINAL SUPPOSITORIES IN DELAYED MENSTRUATION*

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Montreal, Que.

Soskin, Wachtel and Hechter[1] and others found that prostigmine injections were capable of inducing menstruation in a non-pregnant woman. Where no menstruation occurred, (three days after the last injection) the woman was invariably considered pregnant, provided endocrine dysfunction and organic lesions had been ruled out. Prostigmine injections did not affect pregnancy.

The procedure followed by the investigators was that of injecting 1 mgm. of prostigmine methylsulfate intramuscularly for a maximum of three consecutive days (mornings). It occurred to me that it would simplify matters if, instead of administering the prostigmine parenterally, it were possible to have it absorbed *per vaginam*, thus making it possible for self-administration. A suppository was therefore prepared in the following manner:

The contents of one ampoule of prostigmine methylsulfate (0.5 mgm. of prostigmine methylsulfate) were mixed with lanolin anhydrous at room temperature until absorbed. Powdered cocoa butter and a small amount of spermaceti were added to give the mixture solidity, and the mass was moulded into a vaginal cone.

The usual directions for the use of vaginal suppositories were given to the patient. The patient was instructed to insert the cone (larger end first) high into the vagina and to remain in the recumbent position for at least four hours to insure better absorption. Where there was too much leucorrhœa, the patient was instructed to take a saline douche once before inserting the first suppository. The treatment was to be repeated on three consecutive nights unless menstruation occurred sooner. The suppository was to be kept in a cool place.

The cases of delayed menstruation were divided into three groups and the results obtained, recorded.

Group I.—Non-pregnant women in the child bearing age who had had a normal menstrual history up to the last expected period.

Group II.—Pregnant women. The diagnosis was established by the history, physical findings, by a urine pregnancy test, where possible, or by subsequent clinical evidence.

Group III.—Women with endocrine dysfunction of varying degrees, including those in menopause.

Results.—The findings in groups I and II were quite consistent. There were 11 cases in group I, and 12 cases in group II. In all cases in group I, menstruation followed the use of the prostigmine suppositories. In the majority of cases fewer than three suppositories were needed. The onset of menstruation following the treatment in this group was most frequently within twenty-four hours after the last suppository had been used, although in two of the cases two days elapsed, and in another, four.

In all the cases of group II, no menstruation followed the use of the suppositories. There were no immediate or remote ill effects on the course or outcome of the pregnancies. In one case, slight staining which lasted only a few hours, and did not result in an abortion. (This patient had used some ergot tablets previously, in an attempt to "bring on the period".)

Group III comprises 26 cases of women in varying stages of menopause. Such cases were considered by previous investigators as unsuitable for prostigmine therapy; however, prostigmine suppositories were tried and the results offer some room for speculation and comment.

In 11 patients, ages ranging between 40 and 50 with menorrhœa varying from one week to three months, staining or bleeding followed the use of the prostigmine suppositories within five days. Six patients in the same category menstruated within ten days, three within 20 days, after the last suppository was used, and in three patients in early menopause, and three patients in late menopause, no results were obtained.

* Read before the Montreal Clinical Society, Montreal, February 15, 1950.

SUMMARY

Prostigmine methylsulfate used vaginally in the form of a vaginal suppository (prostigmine vaginal suppository) gave similar results to those obtained when used parenterally, in groups I and II. The results obtained in group III, in the cases of early menopause, strongly suggest that the prostigmine suppository played a part in the bringing about of a menstrual flow. In menopause of long standing (that of years) the results were negative. This method is simple, free of any discomforts, and makes possible self administration; it can be an aid in the diagnosis of early pregnancy and also has a therapeutic value in cases of delayed menstruation due to a mild endocrine dysfunction, including early menopause.

A positive diagnosis of pregnancy in suitable cases can be made long before the urine pregnancy test will be positive.

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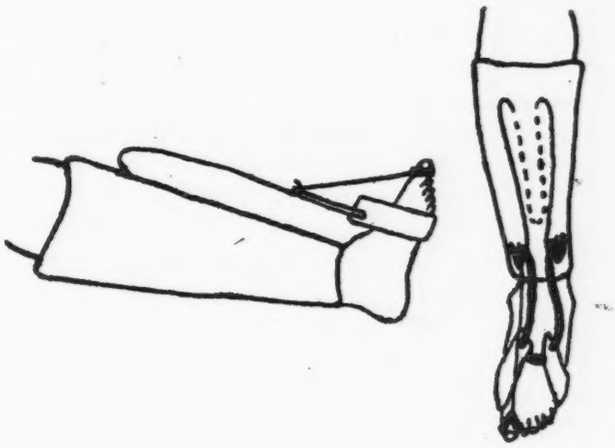
A NEW APPROACH TO THE TREATMENT OF FOOT-DROP

Lorne E. Merritt, M.D.

Merritton, Ont.

Mr. T.N., a sixty-two year old, chronic alcoholic, sustained a fractured right patella, from which injury he was not yet fully recovered, when he fell on November 15, 1949, and suffered an intertrochanteric fracture of the right hip. There was considerable shock following the injury. For three days following admission to hospital this patient suffered from delirium tremens, and symptoms of withdrawal for a longer period. Splints proved useless during this stage and this combined with alcoholic neuritis, which involved the right sciatic nerve (the right ulnar nerve was similarly involved), produced a foot-drop of the right side. Splints failed to produce any improvement whatsoever and the foot eventually reached the stage where no active movement could be performed in the toes or in the ankle joint. Ankylosis in these joints was prevented by daily passive movements. A Smith-Peterson pin was put in place in the right hip on December 1, 1949.

The foot-drop was treated in the following manner: A circular plaster cast was applied to the leg directly over stockingette from immediately above the malleoli to just below the tuberosity of the tibia. A piece of sponge rubber was attached to the inner side of the lower end of the cast directly above each malleolus. A steel coat-hanger, which was cut on both sides of the base of the hook, was bent double and a hook bent into each of the two free ends. The unbroken half of the hanger was incorporated into the plaster cast. A "stirrup" for the ball of the foot was made by taking a strip of three-inch adhesive eight or nine inches long and lining it with a similar piece of flannelette bandage. A hole was made in either end of this "stirrup" and the circumferences of these holes were reinforced with adhesive tape. Then a piece of intravenous tubing was anchored to the hook on the one free end of the hanger by bringing the tubing around the hook and binding with adhesive. The tubing was then bent back on itself and again bound with adhesive so that there could be no slipping. The tubing was then threaded through either end of the "stirrup" and similarly bound to the hook on the other free end of the hanger with sufficient tension on the tubing to bring the ankle joint to slightly more than a right angle. By lining the "stirrup" with flannelette, it can be slipped on or off the foot as desired. When in place the patient does the plantar flexion and the appliance produces the dorsiflexion.



On the second day after this appliance was first put on, some active movement could be elicited in the toes. On the third day slight active movement was noted in the ankle joint. However, it was found that improvement in the great toe was not satisfactory and an addition to the appliance was necessary. A "stirrup" was applied to the great toe with an elastic band running from this "stirrup" to the hook on the medial free end of the coat-hanger. Improvement has been steadily increasing and at the present time the patient can flex his ankle to a right angle and the toes can be moved quite freely.

As far as I have been able to ascertain, nothing of this nature has been previously reported in the literature. The best treatment of foot-drop is still prophylaxis but when it does occur this suggestion is advanced as a possible means of treatment.

THE CANADIAN MEDICAL ASSOCIATION

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EDITORIAL

CHEMOTHERAPEUTICS

THREE possible theoretic explanations exist for the enhanced curative effects of combined chemotherapy according to Dr. J. A. Kolmer.[1] One compound may aid, co-operate with or potentiate the other with a material increase of anti-microbial effects designated as synergistic activity. One of these agents need not be a chemotherapeutic compound: nicotinamide apparently has this effect *in vitro* upon the action of penicillin on *Staph. aureus,* and the susceptibility of highly resistant Gram-negative bacilli to penicillin *in vitro* may be greatly increased by the addition of such amino acids as methione. The enhanced therapeutic activity may be merely a summation of the effects of the two compounds acting independently of each other. The effect may be due to the fact that one compound, *e.g.,* penicillin sharply reduces the number of micro-organisms, which permits another, such as a sulfonamide, only partially bacteriostatic or bactericidal in the presence of a large number of cells to become more efficient in the presence of a smaller number. It is as yet uncertain whether sulfonamide compounds may or may not increase the antibacterial effects of penicillin *in vitro,* but in Kolmer's laboratory in the Research Institute of Cutaneous Medicine at Temple University it has been observed that the smallest amount of penicillin giving complete inhibition of the H strain of *Staph. aureus* in a serial dilution was 0.2 unit, while the minimal inhibitory amount of streptomycin was 0.001 mgm. (1 unit). In mixtures of the two compounds however these figures were reduced to 0.05 unit and 0.0005 mgm. (0.5 unit) respectively. Other observers have reported similar synergistic or additive activity with penicillin and sulfapyridine, and penicillin and sulfanilamide in subtherapeutic doses in experimental streptococcal infections; penicillin and sulfadiazine in pneumococcal and streptococcal infections in mice, and penicillin and mapharsen in experimental syphilis in rabbits. It has also been reported that while sulfone compounds were relatively ineffective in treatment of experimental tuberculosis, combining them with streptomycin gave better results than streptomycin alone, the effects being greater than the sum of the effects from the individual compounds.

Investigating such phenomena in experimental syphilis Kolmer found that while the intramuscular dosage of penicillin totalling 8,000 and 40,000 units per kg. and potassium bismuth tartrate totalling 2 mgm. per kg. did not result in biologic cures, giving the drugs simultaneously, the penicillin totalling 8,000 and 16,000 units per kg. and potassium bismuth tartrate in total dosage of 2 mgm. per kg. resulted in biologic cures, clearly indicating the synergistic or additive activity of the two compounds. In human infections the synergistic or additive activity of penicillin and sulfadiazine has been found of the greatest value in treating putrid lung abscess, as well as for the prevention of infections following lung resections, transurethral prostatectomies, etc.

In pneumococcal meningitis treated with sulfonamides alone reported mortality rates have varied from 58 to 65%, and 48% in cases treated with penicillin alone. Combining the two remedies has reduced the mortality rate in the hands of several workers to less than 25%. Similarly while the mortality rate in influenzal meningitis treated with sulfonamide alone has been about 92%, great reduction has followed the combination of sulfonamide therapy with type B rabbit anti-influenzal globulin and streptomycin. Such combined therapy also appears to be indicated in streptococcal meningitis and meningococcal meningitis. It cannot yet be stated if combined penicillin and sulfonamide therapy is superior to penicillin alone in subacute bacterial endocarditis, but it appears to be clearly indicated in the treatment of acute endocarditis due to beta-hæmolytic streptococci, staphylococci, pneumococci, gonococci and meningococci, while in infections due to influenza and other Gram-negative bacilli combined treatment with streptomycin and sulfadiazine appears worthy of clinical trial. Promizole has been found of little value in various types of cutaneous tuberculosis, streptomycin being more effective, but their combination has not yet been tried.

No indications of increased toxicity in the combined treatment of experimental infection

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have as yet appeared. The reverse might be expected since the doses of each compound used in combination are usually less than would be used if either were used singly.

D. E. H. CLEVELAND

EDITORIAL COMMENTS

The Manitoba Floods

[*The following short note on the recent Manitoba flood disaster has been sent us by our correspondent Dr. Ross Mitchell. Its brevity intensifies the underlying elements of distress, of tension, of invincible high spirit.*

We must not forget however that the subsidence of the flood does not end its effects. The course of life has been terribly dislocated for very many, and help will long be needed.—EDITOR.]

The month of May brought to southern Manitoba and Greater Winnipeg the greatest flood in the history of the Red River. In Morris a gallant but unsuccessful fight was made to keep the new hospital open. In the week of May 10 St. Boniface, King Edward, King George, Princess Elizabeth, Victoria, Children's, Shriners, Concordia and St. Joseph's Hospitals in Winnipeg and St. Boniface had to be evacuated, leaving only the Winnipeg General, Deer Lodge Veterans, Misericordia and Grace Hospitals open. For a time it seemed possible that even the latter two might have to be closed; fortunately this proved not to be necessary. The new Maternity Pavilion of the Winnipeg General Hospital was opened to patients on May 6, a most fortunate circumstance. By the strenuous efforts of civilians and soldiers under the direction of Brig. General R. E. A. Morton power stations were kept operating, so that there was no breakdown of power or light. The water supply from Shoal Lake remained intact and now that the river is subsiding, the possibility of a major epidemic seems remote. Over 100,000 persons were evacuated from their homes during the flood, and for a time it seemed possible that the whole city might have to be abandoned, but the spirit of the people kept surprisingly good. Most generous help has come from other Canadian cities, towns and American cities. On May 27 a giant four-engined strato-cruiser arrived at Stevenson airport from Great Britain carrying the gift of the British government. The flood has shown the ability of people to meet a crisis.

ROSS MITCHELL

Journal of the Canadian Association of Radiologists

The Canadian Association of Radiologists has been the first amongst the specialties to undertake the publication of a Journal suited to its own needs. The intention is to bring out this Journal quarterly until circumstances warrant more frequent publication. The first number appeared in March, 1950, and augurs well for the future. The papers are timely and well arranged with good illustrations. The bilingual aspect of the Journal is admirably maintained; one paper being written in French, whilst French summaries appear in some of the other contributions. There must have been hard, persistent work to produce this Journal, and there will have to be much more to keep it going. We extend our best wishes for its future success.

MEDICAL ECONOMICS

DISTRIBUTION OF MEDICAL SERVICE*

Murray Stalker, M.D.

Ormstown, Que.

It has been said that the mal distribution of physicians between urban and rural areas is the greatest problem facing organized medicine today. I would wish to emphasize that there is a greater problem than mal distribution of numbers and that is a mal distribution of quality of Medical service. Many demands are being made upon our legislators for an improvement in the rural medical service, *i.e.*, The Canadian Federation of Agriculture are very persistent in their demands for an improved Medical Service and have indicated the type of service which they prefer. Surely organized medicine should consider it their duty to lead the thinking in this very important subject.

This problem is being considered in every division of the Canadian Medical Association and also throughout the various divisions of the American Medical Association and elsewhere throughout the world. It appears that the emphasis is being placed on an endeavour to induce more practitioners to practise in rural areas. I wish to advance the idea that this approach is proverbially putting the cart before the horse. The higher the standards are raised for Specialized Medicine, the greater the trend towards specialism; the lower the standards of rural practice the fewer the applicants. Modern medicine requires a long and expensive training; then it requires much expensive equipment in order to practise our art and science. This surely is the kernel of the nut that we are attempting to crack. An individual will not expend 12 to 15 years of special training and a large financial outlay to be faced with the inability to practise his pro-

* Extracts from presidential address delivered at the Annual Meeting of the Quebec Division of the C.M.A., Sherbrooke, Que., April, 1948.

fession in a modern fashion and in such a manner as not to command the respects of his patients, and of his professional brethren.

Therefore without further theory I wish to place before you the premise that to cure this very serious problem of inadequate rural medical service that threatens the foundations of our democratic way of life we must approach the problem from the viewpoint of quality rather than quantity.

I wish to advance certain basic suggestions by the carrying out of which I believe this problem would be solved. I do not believe that these suggestions are original or new, nor am I endeavouring to copy Wilson's "fourteen points" but for the sake of brevity place them in a numerical order for your consideration and I hope study.

1. A two year period of training after graduation before the granting of a licence; one year hospital internship and one year as a rural apprenticeship under approved certified practitioners.

2. Federal and Provincial Scholarships to aid students of merit. These scholarships to require a definite length of time in rural general practice apprenticeship under approved and certified practitioners.

3. The creation of a post-graduate degree in general practice for merit and scholarship. This degree to be equivalent to the Royal College degrees. This should result in the placing of good consultants and approved certified teachers throughout the rural areas to whom apprenticeships could be directed.

4. Subsidy in some form, *i.e.,* Relief from income tax or direct subsidy for postgraduate study for rural practitioners.

5. That our Federal and Provincial Governments be approached by organized medicine to encourage their support in the building of small rural hospital units in all rural areas. Unless this part of our program can be accomplished the other suggestions are futile. Practitioners of merit will refuse to go to an area without modern equipment.

6. That our Universities endeavour to equip our graduates with a practitioner as well as a specialist outlook.

7. Reward in some form such as: (*a*) Credit towards a postgraduate degree. (*b*) Higher standing for their Local Hospital for, co-operative medical grouping with evidence of division of the medical scientific load; regular local medical reporting societies; case recording; publishing of case reports and articles.

8. The formation of a general practitioners' section within the Canadian Medical Association. We have not sufficient voice within the Association, nor on the Council or Central Executive. This section I hope and believe could remedy this situation.

While these suggestions may appear utopian, I hope they may at least deserve study by all members of our Division.

The family physician or General Practitioner has a traditional history of which not only the whole profession but society in general are very proud. He is in addition a very important ambassador of our democratic way of life. We are ill with a serious progressive illness which if not arrested will attack the honour and prestige not only of the whole profession but also our democratic society. We appeal to all members of the Quebec Division for support.

MEN and BOOKS

SOME OBSERVATIONS ON GENIUS

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PART I.

This is the record of a private journey in answer to the question—What is genius? It had its origin many years ago in the reading and study of the letters of John Keats, one of the most penetrating and moving transcripts of the human spirit in our language. Mr. Christopher Morley did not overstate the case when he said of them: "No fit person should ever be allowed to grow old without having read Keats's letters." Keats I think made a good starting point, for here if anywhere you may feel if not quite isolate that mysterious thing that is indifferently called genius or creative imagination or, still more loosely, greatness. You are on enchanted but firm ground and can with some confidence explore other channels—biographical, philosophical, and psychological, many of which are journeys up a blind alley, others very misty indeed, and some few rewarding. When you grow confused or exasperated (as I have done repeatedly) you may return to the bit of firm ground from which you started, still find it circled by the light of the vision splendid, and again feel the authentic power that is so apt to defy the categories of reason and analysis and plain common sense.

There are many reasons for exploring the nature of genius, the most obvious being its perennial interest—an interest which has never been more marked than in our own time when there is a never-ending torrent of biographies dealing with all sorts and conditions of men and women ranging from the authentic genius to the merely gifted eccentric. This interest has found paradoxical expression in the so-called "debunking" biographies, now happily

waning as the wave of cynicism retreats, in which the writers appear to dance about the great in savage glee and pepper them with slugs from sling-shots cleverly contrived in the modern psychoanalytic fashion. The whole performance somehow seems less a new approach to history than a perverse expression of admiration for greatness. It should not be forgotten, of course, that this type of biography has sterner implications. It is sometimes a sign of the perennial war waged by Western Man against the great man, the genius, the *individual* in the real and abiding sense of the word. Democracy in the ascendant too often lets loose the dogs of Philistinism in full cry against genius and all that it stands for. It may be remembered that William James fought against this attitude in 1880 when the Spencerian philosophy prevailed.

Furthermore as the interest in economics and international conflicts has grown, preoccupation with problems of personality has shifted its perspective, but remains no less compelling. Whereas for a time the individual was caught and studied in the limelight of Freudian and allied psychological investigation, yielding values that in some ways have proved elusive and disappointing, the individual man is now the central protagonist in a drama that has the whole of Christendom for its stage. For whatever one may think of the present crisis in our civilization and culture, it is certain the very heart of the conflict concerns two opposing ideas—the concept of the freedom and dignity of man as an individual, and the concept of man as a cellular organism in an authoritarian society. However chaotic the world may seem to us as the struggle proceeds, however gloomy we may become about the corporate fate of society, at all seasons we must repeatedly and sternly remind ourselves that our chief concern is still with the spiritual problems of the individual. It is now more true than ever that the proper study of mankind is man—and man the individual. And because the individual in his most intriguing and dynamic form is the genius, there follows some justification for this study.

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The modern world in practice may not appear to believe that the importance of the arts of poetry and philosophy, music and drama is paramount. At times that world seems to depend upon the scientists for knowledge of the external universe, upon the psychologists for knowledge of the internal mind and upon itself for everything else of which it has need. The world in so doing is tragically deceived. It has never been able to depend upon itself for the essential understanding. That deeper knowledge and wisdom has come in all ages from the intuitive and imaginative perceptions of creative genius.

Whatever its beliefs or false hopes, the world just now is in the throes of an enveloping uncertainty, even a less than stoical despair. Science seems unequal to the task of sustaining the spiritual courage of a world that has inherited ruin and seems fated to go on increasing that ruin. There is a desperate search for some point of faith and with it what can only be called a nostalgia for greatness. The lament is heard on every side "There are no great men in our time." In considering this cry, Santayana asserts that this dearth of greatness (which he admits) is the penalty of the intellectual temper of the age.

> "Greatness," he says, "is spontaneous; simplicity, trust in some one clear instinct are essential to it; but the spontaneous variation must be in the direction of some possible sort of order. . . . How, then, should there be any heroes, saints, artists, philosophers or legislators in an age when nobody trusts himself, or feels any confidence in reason, in an age when the word *dogmatic* is a term of reproach? Greatness has character and severity, it is deep and sane, it is distinct and perfect. For this reason there is none of it today. . . . A comprehensive greatness too is impossible in an age when moral confusion is pervasive, when characters are complex, undecided, troubled by the mere existence of what is not congenial to them, eager to be not themselves; when, in a word, thought is weak and the flux of things overwhelms it."

Whether you agree or not with these strictures, and (remembering that the Greece of the fourth century before Christ was an age not unlike our own and yet was the age of Plato), regard the modern Santayana as too pessimistic, you will allow that this at least is not a bad time in which to reassert the essential nature of genius. This does not imply mere sentimental hero worship. We are all of us too much children of our time ever to be Carlylean. In so doing, our approach is not psychological or scientific only. Such considerations leave out of account too many values. It is best to utilize many hypotheses and more than one discipline of thought and imagination.

There are dangers in the treatment of the subject from which I may pray to be delivered. There must be no pandering to the iconoclast in the hearts of all of us, an emotion which in recent years, God knows, has been adequately nourished and has swept us into the camps of intellectual plebeianism and æsthetic mediocrity. One must at the same time avoid the other extreme—the rhapsodic treatment of genius, and exercise discretion in burning incense before the shrines of the great. It is no less imperative to avoid botanizing on the graves of genius, thus impairing with scientific analysis the dramatic, human quality of our subject.

When all is said and done, the desirable approach to our subject is rather *speculative,* in the best sense of that elusive word. For the rôle of genius in history is as exciting a source of speculation as any that I can imagine. As Amiel says: "Men of genius supply the substance of

history, while the mass of men are but the critical filter, the limiting, slackening, passive force needed for the modification of the ideas supplied by genius."

II.

There is no particular point in wasting much time on a formal definition of genius, if for no other reason than that it is too elusive a thing to be forced into a rigid mould. It is rather better that such definition emerge as the discussion proceeds when reason and common sense may be fired to set down conclusions that will satisfy the inquiring mind. A few formal definitions, however, may be cited, if only to illustrate the difficulties involved in the task when logic confronts genius. One of the best is that of Kretschmer:

> "We shall give the name genius to those men who are able to arouse permanently, and in the highest degree, that positive scientifically grounded feeling of worth and value in a wide group of human beings. But we shall only do so in those cases where the value arises with psychological necessity out of the special mental structure of the bringer of value, not where a stroke of luck or some coincidence of factors has thrown it in his lap."

Kretschmer thus characterizes the genius as one who brings society new and original values.

In another sense genius has been defined as "that intensely sensitive temperament which in the creative arts works by inspiration rather than by reason." As a helpful statement this somehow begs the question too much. William Hazlitt who has written of genius in at least three essays (one, *The Indian Jugglers,* is Hazlitt at his best) equates genius with originality. "Genius," he says, "is for the most part some strong quality in the mind, answering to and bringing out some new and striking quality in nature."

Certainly we must not confuse genius and highly cultivated talent arising from industry and perseverance. No amount of industry ever made a genius, in spite of the currently popular definition of genius as "an infinite capacity for taking pains". Neither is capacity the same thing as genius, nor is cleverness. Life flowing through vitalizing channels and producing what we please to call genius transcends these things.

The real scientific study of genius may be said to begin with the writings of Lombroso of Turin (1891) and Sir Francis Galton (1892). Lombroso stressed the association of genius and insanity; Galton's study was anthropological and statistical, and ignored the psychological aspects. These two writers opened up two trails as it were along which genius has since been pursued—Lombroso's the psychiatric aspect represented at the present time by the psychoanalytical school and much popular discussion, Galton's followed by Cattell, Havelock Ellis and others an approach stressing strict observation, precise methods and psychological measurements as far as possible.

These two lines of study have yielded, speaking generally, three points of view as to the nature of genius.

1. A negative view—genius is biologically linked with insanity and degeneracy.

2. A positive view—genius represents a quantitative increase of the talents of the ordinary man.

3. Genius possesses a nature *sui generis*—it involves not only a quantitative but a qualitative difference from talent. It seems impossible to interpret the phenomena of genius from either the strictly psychiatric or the anthropological and statistical point of view. Here if anywhere one must keep in mind the *synthetic* as well as the *analytic* approach. Accumulation of facts does not constitute knowledge of the problem. The I.Q. method of study alone, for example, as employed by Terman is wholly inadequate.

Following the three points of view already set out, we can indicate briefly the ideas of the principal authors who have written on this subject. In the ancient world genius was sometimes linked with a guardian angel or a tutelary divinity, sometimes referred to as a *dæmon* (it might be good or evil). Just as frequently genius was linked with mental abnormality. Democritus speaks of all good poets as being out of their mind. Plato and Aristotle noted the connection between genius and madness. Seneca wrote: "Great wit and madness are near of kin," an aphorism that centuries later was embodied in John Dryden's famous lines:

> "Great wits are sure to madness near allied,
> And thin partitions do their bounds divide."
> —(*Absalom and Achitophel*)

In modern times Lamartine wrote of "the mental malady that is called genius." Lombroso's opinion in *The Man of Genius* is summed up in his sentence: "Genius is a symptom of hereditary degeneration of the epileptoid variety and is allied to moral insanity." Nisbet in a most provocative book *The Insanity of Genius,* studying a group of two hundred and fifty geniuses stated that all geniuses are neuropathic and that genius is directly proportional to the degree of mental instability. In 1892 there appeared a book *Degeneration* by Dr. Max Nordau which created a great stir in philosophical circles. Nordau maintained that genius and degeneration are closely related but the concepts which he employed are too lurid to receive very serious attention. Nordau's work is remembered today chiefly because it provoked a reply from George Bernard Shaw who in a monograph entitled *The Sanity of Art* (1895) attacked Nordau in his superlative and vigorous style. As an aside one cannot resist quoting from this pamphlet in which Shaw pokes fun at the feeble nonsense and excesses of much psychological

deduction (incidentally as true today as it was fifty years ago).

"If a man's senses are acute, he is degenerate, hyperæsthesia having been observed in asylums. If they are dull, he is degenerate, anæsthesia being the stigma of the craziness which made old women confess to witchcraft. If he is particular as to what he wears, he is degenerate; silk dresing gowns and knee breeches are grave symptoms, and woolen shirts conclusive. If he is negligent in these matters, clearly he is inattentive and therefore degenerate. If he drinks, he is neurotic: if he is vegetarian and teetotaller, let him be locked up at once. If he lives an evil life, that fact condemns him without further words: if on the other hand his conduct is irreproachable, he is a wretched 'mattoid' incapable of the will and courage to realize his vicious propensities in action. If he writes verse, he is afflicted with echolalia; if he writes prose, he is a graphomaniac; if in his books he is tenacious of his ideas, he is obsessed; if not he is 'amorphous' and 'inattentive'."

We may fairly dispose of this group of writers maintaining the association of genius and insanity by pointing out that their arguments are largely speculative, at times nebulous, and reflect in a general way the primitive conception that the man of genius is possessed of a good or an evil spirit.

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A more moderate point of view is expressed by Havelock Ellis who has made several exhaustive studies of this problem. Genius for him is neither the purely healthy variation occurring within normal limits (Galton) nor a socially useful form of insanity (Lombroso). Rather he regards the genius as possessing an unusually sensitive and complex nervous system developed along special lines, and an innate organic inaptitude which prevents him from adjusting himself to the ordinary activities of life. Ellis's ideas have been further elaborated by the modern psychological schools which link genius closely with the neuroses. Broadly speaking, they regard neurotic tendencies as frequent if not invariable correlates of genius. The genius is almost always nervously unstable, extremely sensitive to stimuli, and can release and direct more nervous energy than normal individuals. As a result he exhibits a greater drive. Such a delicately adjusted complex nervous organization is apt to produce an eccentric individual.

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Turning to the view of genius as great talent, its first notable exponent was Sir Francis Galton who in *Hereditary Genius* (1869) maintained that genius is a normal variation of great talent occurring within normal limits. To talent genius added two characteristic traits — energy and almost fanatic zeal. Galton later admitted a "painfully close relation" between genius and nervous abnormality. In more recent times Terman and Cox (*Genetic Studies of Genius*) regard genius as talent written large. They assert that persons of genius always come from the ranks of the gifted (I.Q. of 140 or above) and that the eccentricity of genius is largely a myth. This conception of genius seems to us to be an over-simplification of the subject. There are most certainly other factors in genius beside the essential degree of intellectual capacity, and no one has realized this more clearly than the possessors of genius themselves.

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Finally there is the view that genius is a unique phenomenon and possesses a character that cannot be reduced to the ordinary categories. This position was taken by William Hirsch who maintained that while in some aspects genius may be affiliated with talent, neurosis or at times even a mild psychosis, it is none of these, its essential nature admitting of no inclusion in any other manifestation of life. Differing in kind from the rest of men, the distinguishing feature of the genius is creative intelligence. William James has written persuasively to the same effect. The cause and origin of genius he feels are wholly inaccessible to the social philosopher, and, if we are honest, we must accept the phenomena of genius as data just as Darwin accepted spontaneous variations. In his analysis of genius he would only go so far as to suggest that a first-rate intellect plus intense sensibility almost psychopathic in degree plus obsession by ideas seemed to bear fruit in creative genius. While he discounted the neurosis theory, he stated that a superior intellect combined with a certain type of neurotic temperament seemed to afford the best possible condition for effective genius, pointing out at the same time that there was no special affinity between superior intellect and mental and nervous instability.

This point of view developed by William James seems to be the most satisfactory of any yet put forward. While taking into account all the factors, it makes allowance for the many contradictions involved and acknowledges that in such high matters all cannot be reduced to dogmatic conclusions. It is here that the aphorism or the parable can throw so much more light on the matter than the closely reasoned treatise. As an example take Lord Lytton's saying—"Genius does what it must, talent what it can".

III.

The discussion up to this point has been largely in philosophical terms. We may now turn to the biological sciences for any contributions which may be of value in clarifying our problem. A survey here yields little of value. Physiology and pathology have nothing to tell us. Only in the newer and less definitive field of genetics are there any pertinent observations, and these are concerned with the facts relating to the occurrence of genius and do not deal with the heart of the mystery. Those who

fear the cold dissecting methods of science need have no feeling of discomfort. Blake's cry:

> "Wilt thou stretch out the fibres of my soul
> like stalks of flax to dry in the sun?"

can be answered with equal eloquence:

> "Canst thou bind the cluster of the Pleiades
> Or loose the bands of Orion?"

There is little in the scientific canon that can illuminate the essential nature of genius.

There have been many studies of the hereditary features of genius, the most notable of which have been those of Galton, Havelock Ellis and Cattell. We may indicate in summary form certain conclusions and observations from these studies which seem less than trivial, and in some instances are challenging.

There appears to be a cyclic or periodic nature in the appearance of genius, an outburst of genius in one period being followed by a decline in the next.

The higher grades of genius act in inheritance as though they were due to the *absence of something* present in persons of poorer ability. The individual of genius has got rid of one or more inhibitors (Davenport).

Elements of great genius and mental defects are inherited in the same way. Quoting Havelock Ellis: "We may regard genius as a highly sensitive and a completely developed adjustment of the nervous system along special lines, with concomitant tendency to defect along other lines. It is no exaggeration to say that the real affinity of genius is with congenital imbecility rather than with insanity."

Genius comes from family stocks with ability. Charles Cattell's study of a thousand of the world's greatest geniuses shows that less than one hundred came from origins with less than normal ability.

Geniuses have arisen mainly in the upper classes, the clergy and the well-to-do commercial class. Few if any have come from the proletariat.

The parents of genius have as a rule shown great reproductive activity. In the study of British genius the average family containing a genius was 6.5 children. (Families showing mental difficulties or idiocy numbered 7 children.)

A cross breeding of temperament in the parents is more apt to produce in the child inner tensions and emotional strains predisposing to genius.

Maternal inheritance is more important than paternal.

The youngest or the oldest child is most likely to have genius.

The parental ages in the case of a genius—the father over forty years or elderly, the mother young.

Precocity in youth is not an outstanding feature. Among British geniuses 292 of 1,030 were child prodigies.

There is a remarkable tendency on the part of genius to be either taller or shorter than the average.

Physical ill health or hypochondria are fairly common among geniuses. In the British group twenty per cent were thus afflicted.

Geniuses owe a remarkably small proportion of their learning to the established machinery of education.

Genius tends to suffer from minor nervous disorders, particularly involving motor co-ordination. This accounts for the aversion to sport so frequently seen among men of genius. Stammering is common and the bad handwriting of genius is notorious. Macaulay could not use a razor or tie his cravat. Priestley could not handle tools. Shelley though lithe and active was always tumbling over himself.

Celibacy and sterility are more common among geniuses than in the average population.

Geniuses have been lovers of solitude probably instinctively because they realize that excellence is to be attained only "by an inveterate resolution against the stream of mankind".

The genius tends to suffer from melancholy, partly for constitutional reasons and partly due to the hostility of society. Ellis for example found that 16% of eminent British geniuses had been imprisoned.

A review of the characteristics noted in the foregoing clearly indicates that from the standpoint of genetics genius heads the list of unpredictables. "Picking a winner in the cradle or by looking over the parents is the world's worst gamble." We can predict albinism, colour blindness and certain other abnormalities but not genius. Thus it becomes apparent that from the biological point of view we know virtually nothing of the variation we term genius. There is no certain answer as to its origin. Like the wind, it bloweth where it listeth. Its emergence is uncertain, its manifestations varied and its qualities elusive. The force implied in genius is incalculable and uncontrollable.

(To be continued)

MEDICO-LEGAL

UNSKILFUL SURGERY*

T. L. Fisher, M.D.

Secretary-Treasurer, The Canadian Medical Protective Association, Ottawa, Ont.

The defendant doctor, in the course of his duties as the family doctor, circumcised the infant plaintiff in the early part of August, 1947. There is conflicting evidence as to what actually happened in the operating room at the time of the circumcision. It is not clear whether, the usual cautery being out of order, the doctor was given and started to use the diathermy cautery before he was aware that he was not using the instrument to which he was accustomed, or whether he was informed that the usual cautery was out of order and agreed to use the other on the assurance of the operating room nurse that other doctors used it for the same purpose. He did use the diathermy cautery however to such effect that not only was the prepuce destroyed but much also, if not most, of the glans penis.

This doubt as to the discussion preceding or accompanying the use of the diathermy cautery might have had an important bearing on the final disposition of the case had not the doctor, shortly after the accident, given a statement to the adjuster for the hospital insurers in which he absolved the hospital and its nurses from all

* E. N. Gray and E. N. Gray vs. G. M. LaFleche, Mennonite Hospital Society Concordia and Freda Unruh, Court of King's Bench, Manitoba.

responsibility. He adhered to this opinion during his trial so that the Honourable Judge Williams, Chief Justice of the King's Bench of Manitoba, in his decision said: "Indeed, on cross examination, the doctor, in effect, withdrew any charges his pleadings made and stated he never intended to blame either of them."

The problem remaining then was stated in the judgment to have been: "The doctor performed the operation so unskilfully that the infant plaintiff sustained severe injuries and this action was brought to recover damages."

As the basis for his judgment the Judge considered various points which influenced his decision. It was accepted that "The injury sustained was to the glans penis. . . . There was no injury to the shaft or any portion of the penis other than the glans, nor have the seminal vesicles been damaged in any way."

Some short time later, "The child's penis was swollen and purplish and almost at once the baby began to have trouble voiding, straining its body, and screaming with pain."

By the beginning of September it had been necessary to have another doctor see the infant and "He found the end of the penis largely covered with granulated tissue or proud flesh which later became scar tissue."

The amount of damage to the glans was difficult to decide, opinions and descriptions of witnesses differed. Contributing to the difficulty was the uncertainty of the defendant doctor. The Judge stated:

> "The doctor's evidence was such a mass of vagueness, contradiction, and even quibbling, and his memory was so bad, that I am satisfied he was in a state of complete mental confusion; that at the time of the operation he was not sure what he was doing and did not, and does not, remember everything he had done."

Summing up, the Judge held that

> "I am convinced, and hold, that the infant plaintiff's glans penis is, to all intents and purposes, gone, and even if tiny bits of the edge of it remain the infant plaintiff will have to go through life with a deformed glans penis and, therefore, a deformed penis."

The effect of this deformity on the infant as he grew to maturity was considered. It was decided he would be able to have an erection (though perhaps the scar tissue would prevent it being wholly normal), that he would "possibly be able to perform the sexual act and, again depending on development, reproduce", but that "one would expect his attempts at intercourse to be not on the normal scale. . . ."

No conclusion could be reached about the effect of the injury on the mind of the plaintiff as he attained maturity.

Before deciding the question of damages consideration was given various influencing factors. Not only those mentioned, the amount of damage and its possible effects, but the pain and suffering involved at the time of the injury and in the future, the probability of further necessary surgery from time to time, and the fact that the infant plaintiff must go through life "deformed in one of his members".

Part of a previous judgment was quoted [McGarry v. Canada West Coal Co. (1909) 11 W.L.R. 597 at 599 and 602, 2 Alta. L.R. 299, Stuart, J.]

> "A man is entitled to his limbs as nature gave them to him and with their natural strength, no matter whether their weakening by injury would affect his income or not, and for any weakening by injury due to negligence of another he is, in my view, entitled to some compensation. . . ."

Excluding from his considerations those things which "would carry us into the realm of Neuro-Psychiatry", remembering "the many contingencies that may arise in the future", the Judge felt the amount of damages should be influenced by the fact that the success and full enjoyment of a possible marriage might be prejudiced by the injury.

> "I hold the opinion that one of the principal ends of the institution of marriage is the solace and satisfaction of man and woman and that physical injuries which may interfere with the conjunction of bodies may be taken into consideration in assessing damages."

Also the chances of marriage might be lessened.

It was decided the damages should not be punitive. A rule previously stated was cited [Jackson v. C.P.R. (1915) 8 W.W.R. 1043, 9 Alta. L.R. 137 at p. 1050, Beck, J.]

> "In the case of personal injuries occasioned by negligence exemplary, vindictive, retributory, or punitive damages cannot be recovered unless there was such want of care as to raise a presumption that the defendant was conscious of the probable consequences of his carelessness and was indifferent, or worse, to the danger of the injury to other persons."

and the Judge went on

> "While, in performing the operation in question, the defendant doctor showed an extreme lack of skill, he was not indifferent, or worse, to the danger of the injury to the infant plaintiff though he was rather casual afterward. I gathered that he was distressed at the result."

The damages to the infant plaintiff then were set at $10,000.00.

"The results to date indicate that no test of definite value has been found for advanced cancer, and the study of the chemical and physical conditions in advanced cancer indicate that no universal reaction of the serum should be regarded as a possibility."—[Jas. Ewing, 1931.]

"With our present lack of more precise knowledge, it appears impossible today to foresee a general test for cancer. . . ."—[F. Homburger, 1950] From *Harper Hospital Bulletin*, **8**: 61, 1950.

ASSOCIATION NOTES

PRESIDENTIAL ADDRESS*

J. F. C. Anderson, M.D.

Saskatoon, Sask.

[*After extending a warm welcome to the overseas members of the Commonwealth Conference, Dr. Anderson went on to say:*]

The Canadian medical profession has much to offer the people of Canada in medical services. Medical services have been increased in quality and quantity throughout the last century in a truly remarkable way, and the quality and the distribution of these services will continue to be our very great concern, as it has been in the past. The people of Canada are seeking ways of obtaining medical services in full and adequate measure, without obstacles, financial or otherwise, placed between the patient and the medical service. We share with the people of Canada the attainment of this objective. There naturally exist many opinions as to how it can be attained. That this is so is by no means an unhealthy sign in any true democracy. Many plans advocated, however, fall far short of the accomplishment of the best in medical services for the people.

The Canadian public, and the Canadian Governments, Provincial and Dominion, are looking for leadership. They are looking we hope for reliable information, based not alone on theory and statistics, but on that far richer and more certain field of actual experience, and knowledge. All across Canada, the various Provincial Divisions of the Canadian Medical Association have offered their experience, and knowledge to their respective Provincial Governments, and the Canadian Medical Association to the Dominion Government. However, this official action is not enough. Every medical practitioner should assume a responsibility within his community, of meeting and guiding the people in their efforts to obtain an adequate medical service.

There are no differences between the aims of the profession and those of the people, in making the services of medicine available to all those who should have these services. We must stand with the people against any system which permits of unwieldy, obstructive, or extravagant administration; any system which restricts the patient from receiving prompt and efficient service; any system which destroys the privilege on the part of the patient of choosing his physician or hospital.

In judging the worth of any system of supplying medical service, we should remember the warnings of many of our democratic leaders in respect to the loss of freedom and liberty. In the words of Franklin Roosevelt: "New ideas can be good or bad, just the same as old ones". Not all that is new means progress. In the words of Jefferson, "Eternal vigilance is the price of liberty". Speaking on the same subject, the famous Burke, offers us the caution "The people never give up their liberties but under some delusion", and further from his lips, "The true danger is, when liberty is nibbled away for expedients, and by parts".

The Canadian medical profession stands ready to share with the public and all other concerned groups in the responsibilities to be assumed in the planning and provision of health services. No words of mine could so eloquently, and well express the mission of Canadian medicine, as that embodied in the Code of Ethics of the Canadian Medical Association, as adopted in June, 1938, from which I quote:

> "For the Physician, the first consideration will always be the welfare of the sick. On his conscience rest the comfort, the health, and the lives of those under his care. To each he gives his utmost in science and art, and human helpfulness. Their confidences are safe in his safekeeping, except in those rare instances when the safeguarding of society imposes a higher law. Even when he cannot cure, he will alleviate, and be counsellor, and friend. It is a special duty, for one who stands guard over the lives of men, to keep his science and his art in good repair, to enlarge and refresh his knowledge constantly, and to give to his patients treatment that is not only sympathetic, but the best possible in the circumstances."

The vision of the Physician should reach beyond the welfare and the cure of humanity. The new medicine is social as well as clinical, with new ways of distribution to the needs of the people. The new medicine asks how the utmost possible in service can be made most widely and instantly available, reaching beyond those who ask, to those who need but do not ask, and those who need, yet do not know they need.

Any wastage of health or life anywhere is a challenge to our profession. It is our privilege to be preventors of disease, as well as curers; statesmen and ambassadors of health; planners of new worlds; counsellors of the people of a new day.

Everything that can be urged rightly for the advance of Medicine, or for the higher ideals, and higher standing of the profession of medicine, is in the long run, for the greater good of the whole community. It is the art and mission of medicine to take all that is known in fact and science, and to apply it skillfully, wisely, gratefully, and beautifully, to the needs of sick people, and to the ways of life for men and nations.

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* Read at the Eightieth Annual Meeting of the Canadian Medical Association, Saskatoon, June 15, 1949.

MEDICAL SOCIETIES

The Ontario Medical Association

Dr. E. K. Lyon of Leamington was elected president and Dr. Miln Harvey of Kitchener president-elect at the annual meeting in Ottawa. Dr. Carman White of Chatham is chairman of Council. Two long days and two long evenings were spent in Council deliberations. Every year economic problems take more time and consideration. The 4,800 members of the O.M.A. who are not on Council are deeply indebted to the 140 members who struggle to evolve a tariff, just and fair to both doctor and patient. A fee is no longer a private matter between two people. It is big business because of the rapid growth of prepaid medical schemes. Last year the Windsor Associated Medical Services paid in the neighbourhood of $18.00 in medical fees for every man, woman and child enrolled in their scheme.

The Symposium of Cancer was timely and interesting. Dr. Charles J. Smith of Chicago took a poor view of the studies of cervical smears; in a fairly large series he stated there were 22% false positives. He said that every woman over forty, married or single should have her cervix examined every six months. He was of the opinion that visual examination of the cervix yielded a good deal of information with biopsy when in doubt. Dr. Hans Selye, Montreal, spoke on the Stress Syndrome in his usual imaginative and charming manner leaving his audience mentally stimulated. The doctors' wives at Ottawa went all out to give the visitors a very good time. Smoothness and efficiency of organization was evident; nothing seemed to be too much trouble for them and everybody enjoyed the teas and luncheons and the drives and meeting new people. Their hospitality is something to remember.

LILLIAN A. CHASE

Quebec Association of Pathologists

The fifth Annual Meeting of the Quebec Association of Pathologists was held at the Pathological Institute of McGill University on May 26, 1950.

The following papers were presented: (1) Glycogen infiltration (so-called "hydropic degeneration") of the pancreas in human and experimental diabetes mellitus—Dr. Wilfred E. Toreson. (2) Un cas de carcinoide de l'ileon—Dr. Simon Lauzé. (3) Bilateral hæmorrhagic infarction of the kidneys with renal vein thrombosis in children—Drs. Sidney D. Kobernick, J. R. Moore and F. W. Wiglesworth. (4) The relation of the lesions of hypersensitivity to the collagen diseases—Dr. Robert H. More. (5) Plasmacytoma of lymph node followed for three and one-half years—Dr. M. A. Simon. (6) Ferrous sulphate poisoning—Report of a case—Dr. Charles W. Jones. (7) The mechanism of the inhibition of experimental cholesterol atherosclerosis in alloxan diabetic rabbits—Dr. Torrence P. B. Payne. (8) The pathology of the diseases of children—A review—Dr. F. W. Wiglesworth.

The business meeting was largely devoted to a discussion of the urgent need of wider pathological diagnostic facilities throughout the Province of Quebec and the means by which this need might be fulfilled. The committee studying the existing pathological facilities in the Province submitted an interim report. The following executive was elected for the ensuing year: *President*—Dr. J. E. Morin; *Vice-president*—Dr. J. L. Riopelle; *Secretary-Treasurer*—Dr. Paul Martin.

La société médicale des hôpitaux universitaires de Québec

Société médicale des hôpitaux universitaires de Québec le 3 mars, 1950.

Revue des cas d'arthrite depuis juillet 1949.—J. Rousseau et C. Delisle.

Compilation et division, selon leurs diagnostics, de 100 cas d'arthrite vus à l'Hôpital des Anciens-Combattants, Québec. La moitié de ces cas étaient diagnostiqués ostéo-arthrite généralisée, de la colonne ou des membres; il est à noter que la traction cervicale fut très efficace dans tous les cas où il y avait pincement des interlignes cervicaux. Les autres traitements ont donné des résultats variables, soit en soulageant la douleur ou en améliorant l'état général de ces malades.

La deuxième moitié des cas étudiés comprenait des spondylites ankylosantes que le traitement de routine a améliorées, des gouttes et arthrites de la goutte, une maladie de Paget, deux cas de maladie de Scheurmann, un syndrôme de la main et de l'épaule, deux cas d'arthralgie consécutive au rhumatisme articulaire aigu, une hernie discale, deux cas d'arthrite tuberculeuse, sept cas de fibrosite et des cas d'arthrite rhumatoide.

L'association acétate de désoxycorticostérone et acide ascorbique telle qu'instituée par Lewin et Wassen en Angleterre a été essayée chez sept patients: 4 cas d'arthrite rhumatoide, 1 cas de spondylite ankylosante, 1 syndrôme de Reiter, et un cas d'arthrite tuberculeuse. Les résultats ont été comparables à deux donnés par Lewin et Wassen dans leur article paru dans le Lancet du 26 novembre, 1949.

La maladie d'Albers-Schönberg (Ostéopétrose-Ostéo-marmoréose).—S. LeBlond, P.-E. Côté et R. Pichette.

La maladie d'Albers Schönberg ou ostéopétrose, est une affection plutôt rare qui se caractérise par une densification du système osseux avec déformation en massue des os longs et une anémie par destruction progressive de la moelle.

Monsieur R. (57 ans) présente les manifestations radiologiques de la maladie et une anémie relative. La maladie semble être apparue tardivement chez lui et ne présente de caractère familial, comme en témoignent les examens radiologiques et sanguins de trois membres de sa famille. Il présente, en plus, un état de confusion mentale qui semble plus en rapport avec une intoxication chronique alcoolique qu'avec le maladie d'Albers Schönberg.

Confusions mentales.—J.-Chs. Miller.

Deux cas d'intoxication exogène (alcool et barbituriques), et un cas d'intoxication endogène (cardiaque brightique) ont développé des confusions mentales transitoires allant jusqu'à l'onirisme et l'hallucinose. Rappel de l'aspect clinique des confusions mentales autrefois confinées aux milieux psychiâtriques fermés avec internement du malade. Les facilités modernes de l'hygiène mentale avec services psychiâtriques dans les hôpitaux généraux, évitent souvent aux malades le préjudice de l'internement; elles permettent une collaboration plus rapide et plus efficace entre la médecine somatique et la psychiâtrie pour la prévention et le traitement de plusieurs affections mentales.

Deux cas d'Hématémèse grave.—J.-Ls. Petitclerc et G. Marceau.

Un faible pourcentage de malades meurent à la suite d'une hématémèse. De ce pourcentage, seulement quelques malades parmi ceux qui présentent un ulcère bénéficient d'une intervention d'urgence qui doit être faite dans les premières 48 heures. La gastrectomie partielle est l'intervention de choix. Quant aux autres malades, il est rare qu'ils puissent s'exempter d'une intervention qui devra avoir lieu dans les circonstances les plus favorables pour le malade. Deux cas d'hématémèse grave sont présentés avec leur traitement respectif.

Société médicale des hôpitaux universitaires de Québec le 20 janvier, 1950.

Etude clinique et hématologique sur 48 cas d'anémies pernicieuses.—J. Ls. Bonenfant et M. Guay.

Les symptômes et signes neurologiques et digestifs devraient suggérer le diagnostic dans un nombre appréciable de cas. L'absence d'acide chloridique dans la sécrétion gastrique possède une valeur négative importante pour le diagnostic. La présence de mégaloblastes dans le sang périphérique est un signe pathognomonique. Le diagnostic reste possible en leur absence mais alors il faut prendre en considération non seulement

la valeur globulaire et le diamètre moyen des globules rouges mais adjoindre la formule blanche. Le myélogramme rend service dans certains cas d'anémie sévère aussi bien que dans les formes discrètes. La thérapeutique apparait comme inutilement complexe. Les préparations de foie par voie intra-musculaire suffisent. L'acide folique n'est pas indiqué. La valeur de la vitamine B12 pour traitement de routine reste à déterminer.

CANADIAN ARMED FORCES

Surgeon Commander W. J. Elliot recently assumed the duties of Assistant Medical Director General, R.C.N., replacing Surgeon Commander R. A. G. Lane who has been appointed as Medical Liaison Officer, Office of the Defence Research Board Member, Canadian Joint Staff, Washington, D.C.

Surgeon Commander G. W. Chapman has been appointed Command Medical Officer, Pacific Coast, relieving Surgeon Commander T. B. McLean. Dr. McLean is commencing a course in orthopædic surgery at the U.S. Naval Hospital, San Diego, California.

Surgeon Lieutenant Commander F. C. Jones has taken up appointment in the R.C.N. Hospital, Halifax. During the past year he has undergone training in the Toronto Psychiatric Hospital.

Following a seven months' course in the Hospital for Sick Children, Toronto, Surgeon Lieutenant Commander J. W. Rogers has returned to the R.C.N. Hospital, Esquimalt, B.C.

Brigadier W. L. Coke, O.B.E., R.C.A.M.C., Director General of Medical Services of the Canadian Army and Lieut.-Col. S. W. Cavender, U.S.M.C., United States medical liaison officer at Army Headquarters, visited Eastern Command during the month of June, inspecting the Active and Reserve Force army medical units in Nova Scotia, New Brunswick, and Newfoundland.

The following R.C.A.M.C. officers assisted provincial and civilian medical authorities during the recent Manitoba floods: Lieut.-Col. G. L. Morgan-Smith, O.B.E., Command Medical Officer, Prairie Command; Colonel J. N. B. Crawford, E.D., of the Directorate of Medical Services, Army Headquarters, Ottawa; Colonel T. E. Holland, A.D.M.S., Medical Advisory Staff, Prairie Command; Lieut.-Col. C. E. Corrigan; Major A. R. Tanner. The officers of the Reserve Force Medical units in the Winnipeg vicinity were also called out. A detachment of one officer and 24 other ranks from No. 37 Field Ambulance, Camp Borden was supplied for duty at the emergency centre at Stevenson Airfield, Winnipeg. Field equipment, medical supplies and immunization material were supplied from Central Medical Stores, Ottawa.

On April 14, 1950, the graduate students of the School of Hygiene, University of Toronto, paid their annual visit to Camp Borden. The purpose of this visit was to study the public health aspects of a military community. Dr. M. H. Brown, O.B.E., accompanied the group in his capacity as Director of Field Training, School of Hygiene, University of Toronto. Lieut.-Col. W. R. I. Slack, Commanding Officer of the R.C.A.M.C. School, directed an interesting program at the camp.

Lieut.-Col. E. J. Young, R.C.A.M.C., visited the School of Hygiene, University of Montreal, on March 25 and April 15, and gave the annual lectures on military hygiene to the graduate students of the school.

The R.C.A.F. entered a scientific exhibit at the Aero Medical Association meeting in Chicago, May 29 to 31, and the following four papers were presented under the auspices of the R.C.A.F.: "Evidence of Accident Proneness in Pilots with Non Combat Fatal Accidents", "The Effect of Altitude Anoxia on the Central Nervous System", "Quantitative Determination of Stimulus Required to Produce Motion Sickness", "Problems in Assessing Winter Flying Clothing".

Wing Commander G. D. Caldbick and Lieut.-Col. H. M. Stephen attended the United States Public Health Services Short Course in Venereal Disease at Hot Springs, Arkansas.

CORRESPONDENCE

A Warning About State Medicine

To the Editor:

State Medicine in some shape is almost certainly round the corner, but is the profession taking a sufficiently active and intelligent interest in determining that shape before it is too late? Last week I was talking to a friend,—it so happens from the U.K.,—who has recently become assistant in a lucrative practice in the West. It seems that the office nurse phoned him that young Johnny S. was coming to see him, but not to do more than the bare minimum for him as they couldn't pay much and anyhow owed the practice $500 already. "And whatever the defects of the British system", as my friend remarked, "such a conversation couldn't possibly occur over there".

Now this brief conversation, which doubtless recurs in many an office, cartoons poignantly the dilemma which is gnawing away at conventional medical practice on the American Continent. It reaffirms the inability of many families to meet the expense of necessary medical services, and it indicates the understandable reluctance of doctors to do more than a necessary minimum if they feel that payment is unlikely. These are two very basic facts, and it is just as important to remember them and discuss them as it is to get together over learned and technical discussions. The medical profession in this country and the U.S.A. cannot lag much longer behind the pressure of events; whether we like it or not the welfare state is on its way, and for obvious survival reasons no free enterprise society can afford to withhold the type of benefits that are being offered to an increasing number of persons under socialist governments.

Efficient low-priced health services cannot be kept on ice much longer, the issue is becoming political dynamite, and if the profession does not soon devise a serious solution, politicians and the public certainly will. Indeed the thin end of the wedge is already very apparent in the D.V.A., Public Health services, Workmen's Compensation Board, Blue Cross and allied schemes. In their heart of hearts all doctors wish the best health for the public, and, in their heart of hearts they also know that the price of this commodity is often crippling and contradictory; therefore, the rather strenuous opposition to inroads on the status quo such as we are witnessing in the U.S.A. constitutes a moral impasse; and here again, if we are honest, is not this attitude conditioned as much by a fear of dropping into a lower income bracket as by a fear of infringement of the doctor-patient relationship? And here my friend's story is re-emphasized; for nothing can more subtly impair this relationship than the dollar, either by its presence or its absence; in my friend's case only the bare minimum was to be allowed; in other cases a great deal more than the optimum is performed.

Let no one suppose that a doctor is not worthy of his hire: his arduous work and long hours probably make him worthier than any other labourer. It is just that the tremendous overheads of modern medicine and the intolerable high cost of living make the conventional methods of hiring pretty well obsolete.

An increasing proportion of every doctor's income comes to him via the various public sources mentioned above, but the integrity of his relationships with patients is not thereby contaminated. He is not ashamed of the money, he is indeed glad that it entails no bad debts. Inevitably a greater and greater proportion of his income is going to be paid through such sources until, as in Britain and other countries, the fee-conscious practitioner will be a thing of the past, and Dr. Collect'em himself will fade into bankruptcy; few would mourn him.

R. SPICER, M.D.
Olds, Alta.

Estimation of Prothrombin Time

To the Editor:

Dr. L. B. Jaques and his associates in their article, "A New Prothrombinopenic Drug, Phenylindanedione", (*Canad. M. A. J.*, **62**: 465, 1950) make the statement: "As emphasized by Link, the procedure of Quick is not satisfactory for following the action of dicoumarol". It is perplexing why they continue using my method after making this statement.

One is inclined to suggest that before committing oneself to such an uncritical and unfounded remark, it might be well to read and study some of my articles, such as the one which appeared in *J. Biol. Chem.*, **161**: 33, 1945, in order to learn how accurate and sensitive my method is in showing the action of dicoumarol on the prothrombin concentration of the blood. When this procedure is carried out correctly the prothrombin time of normal dog plasma is 6 seconds, and not 10 seconds, which Jaques and his co-workers record as normal in Fig. 2 of their article. With the expanding therapeutic employment of dicoumarol and allied drugs, it is becoming increasingly more apparent that, both for scientific accuracy and for clinical safety, laboratories should learn to do my test correctly and shy away from the numerous modifications which have neither increased the simplicity nor the accuracy of the original procedure.

Department of Biochemistry, ARMAND J. QUICK
Marquette University School of Medicine,
Milwaukee, Wisconsin, May 24, 1950.

To the Editor:

Dr. A. J. Quick objects to the statement made by us in a recent number of this Journal, "as emphasized by Link, the procedure of Quick is not satisfactory for following the action of dicoumarol". This statement was presented as a summary of what, in our opinion, appears to be the general view expressed in the current literature on this matter. Certainly Dr. Quick's own articles were not ignored in making this statement. For those of your readers who would like to study this matter further I refer them to References (1) and (2), in which this subject is discussed at great length and particularly to the recent extensive studies of Olwin reported in (1). Olwin determined prothrombin times according to the Quick procedure exactly and found that this was neither accurate nor safe for the control of dicoumarol clinically. Studies in Link's laboratory and my own have emphasized the same point for laboratory investigations.

Dr. Quick apparently fails to understand that there are two ways in which the term "Quick prothrombin time" is used. It is used rather widely in a textbook sense, for any procedure which consists in measuring an accelerated clotting time (that is the clotting time of plasma with added thromboplastin). This use of the term is due to the high regard in which Dr. Quick is held by his colleagues and their appreciation of the significant contribution made by him in the field of blood coagulation in popularizing the use of the accelerated clotting time test. The "Quick prothrombin time" has taken its place in the literature along with "Benedict's solution", the "Wassermann reaction", etc. The second use of the term "Quick prothrombin time" is as a reference to the technical details recommended by Quick. To avoid confusion, we expressed this as "the procedure by Quick". Dr. Quick himself has changed these details twice in very important particulars and other workers reserve the right to make such changes providing, of course, this is recorded in their publications.

Publication by a scientist of a procedure in the scientific literature does not endow the scientist with any proprietary rights in the procedure. It is a part of the progress of science that procedures are altered and improved as required in the course of further investigations, and it is rare that the work of one single investigator survives this process unchanged. As indicated in the literature references cited, valuable as the prothrombin time determination carried out following the exact directions of Quick has been historically, it has been found that this is not the most satisfactory procedure for controlling dicoumarol therapy, either in the routine hospital laboratory or in an experimental laboratory developing new anticoagulants. I therefore expect that most workers in this field will continue to do determinations of the "Quick prothrombin time" not by the procedure of Quick, but as modified by one or other groups of workers.

L. B. JAQUES

Department of Physiology,
University of Saskatchewan,
Saskatoon, Sask., Canada,
June 3, 1950.

REFERENCES

1. Proceedings of the Josiah Macy Junior Conference on Blood Clotting and Allied Problems. 1st Conference, New York, 1948; 2nd Conference, New York, 1949; 3rd Conference, in press.
2. SHAPIRO, S. AND WEINER, M.: Coagulation, thrombosis and dicoumarol, New York, 1949.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

TRAINING THE GENERAL PRACTITIONER

Under the title of "General Practice and the Training of the General Practitioner" the British Medical Association has just published a report which constitutes a useful corollary to the Collings Report referred to in this correspondence recently (May, 1950). Much too long to be summarized here, the crux of the whole report is that a period of three years should elapse between registration and the assumption of independent general practice. These three years are to be spent as follows: the first year as a "trainee-assistant" to an established general practitioner of at least five years' standing; the second year back in hospital holding a "specially designed and preferably residential hospital appointment"; the third year to be devoted to "supplementary training at the choice of the trainee". Many other recommendations are put forward for ameliorating the lot of the general practitioner, increasing facilities for refresher courses, and counteracting the present tendency to reduce the status of the general practitioner.

What will interest many senior practitioners of the old school is the fact that the committee has felt it necessary to include in the report statements such as, "the general practitioner must retain his acquaintance with those imaginative and creative works of permanent value . . . which represent the highest reaches of the human mind". To many this suggests that, if there is anything wrong with general practice in this country, the fault is a fundamental one and lies in the lack of a cultural background to the ordinary medical curriculum.

THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH

The opening last month by H.M. The King of the new buildings of the National Institute for Medical Research marks the opening of a new era for medical

research in this country. It is just forty years since the Medical Research Committee, as it was then known, was set up, and it was particularly appropriate that the opening of the new Institute should have taken place while the veteran Lord Addison was chairman of the Council, as he was one of the original members of the Committee when it was founded. The Institute is the largest of its kind in the British Empire and will eventually house a staff of 400. Exclusive of stores and the magnificent Fletcher Memorial Hall, a fitting tribute to the memory of Sir Walter Fletcher, the first secretary of the Council, the floor space of the Institute is about 90,000 square feet. Fittings and equipment are of the most up-to-date character. It is indeed a research institute of which the country has every reason to be proud.

Register of Complaints

The Medical Defence Union has just drawn attention to a "grave instance of intervention without consultation with organizations representative of the profession" on the part of a group hospital management committee. Apparently this committee is having printed a register in which members of the medical staff will be "required" to record complaints made by patients with regard to their care and treatment. The register will be accessible to departmental officers "to ensure that there is readily available in the register of complaints an answer to criticisms that may be made by questions in Parliament, or by letters to Members of Parliament, the Minister of Health, the management committee, or the press". The Medical Defence Union has passed a resolution condemning the proposal which "is fraught with danger for the medical staff of the hospitals concerned". This is but another example of how the medical profession is being increasingly ignored as the National Health Service gets under way. What is even more sinister to many is the way that the doctor-patient relationship is fast losing its personal aspects and becoming merely a legal relationship.

Euthanasia

Recent events in the United States lend a somewhat piquant interest to the following recent comments on the subject by two leading Churchmen.

"When we are confronted with suffering which so far as we can see, can have no beneficial effect and which is wholly destructive in its consequences, there is, I urge, a *prima facie* duty to do what we can to bring it to an end". The Dean of St. Paul's Cathedral.

"The Dean was expressing a purely personal opinion and was not speaking for the Church of England. The Archbishop, in his personal capacity, does not agree with the views expressed". A representative of the Archbishop of Canterbury. WILLIAM A. R. THOMSON

London, June, 1950.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Clinical Experiences with Thiomerin. Enselberg, C. D. and Simmons, H. G.: *Am. J. M. Sc.*, **219:** 139, 1950.

Various sulfhydryl-containing substances have been shown to diminish the toxicity of mercurial diuretics without necessarily impairing their diuretic action. One such combination which appears to have excellent diuretic properties is thiomerin. This is identical with mercuzanthin except that the theophylline link is replaced by sodium mercapto-acetate. The drug is readily soluble in water and can be given subcutaneously. In this study, 3,314 injections of thiomerin, containing 5,161.5 c.c. were given to 205 patients. Of these 20 received 55 or more injections, and 3 received more than 100 injections each. All but 14 injections were subcutaneous. One patient who received 135 injections of thiomerin, totalling 214 c.c., received 130 of these injections at home given by himself or members of the family. Diuretic response to the drug was the same qualitatively, and appeared to be about the same quantitatively, as to the theophylline containing mercurials. In this series, no hypersensitivity reaction was encountered, and no instance of general toxic effect occurred. Local reactions occurred in 8 patients, one of whom developed a slough. In the latter case, the reaction was attributed to faulty technique of injection. No local reactions have occurred since November, 1948, presumably due to improvement in manufacturing methods. The authors conclude that thiomerin is a safe and efficient diuretic, and that depending upon further observations, the ultimate value of this drug may soon be realized; that is, administration in the home by a member of the family or by the patient himself.

J. H. DARRAGH

Clinical Observations Concerning Schizophrenic Patients Treated by Prefrontal Leukotomy. Hoffman, J. L.: *New England J. Med.*, **241:** 233, 1949.

Of 42 patients treated by leukotomy in 1947-48, four are dead; 14 have been allowed out of hospital; 16 still in hospital could leave as far as their conduct is concerned, while eight still experience episodic disturbed behaviour. Prefrontal leukotomy should only be employed as treatment in the chronic schizophrenic who is assaultive, combative, homicidal or suicidal and in whom all other forms of therapy have failed. The operation substitutes a permanent organic defect for the emotional one and produces an individual who is devoid of all emotion, is dull, apathetic, unable to carry out anything but the most simple of tasks and requires a protective environment. NORMAN S. SKINNER

Orthoxine in Bronchial Asthma. Schiller, I. W., Lowell, F. C., Franklin, F. and Denton, C.: *New England J. Med.*, **241:** 231, 1949.

Careful clinical study of the therapeutic effect of orthoxine (orthoxine - orthomethoxy - b - phenylisopropyl methylamine hydrochloride) in 50 patients with bronchial asthma demonstrated that it was effective in the milder type of case. While its effectiveness was not quite equal to that of ephedrine it caused less disturbance of the cardiovascular and central nervous systems.

NORMAN S. SKINNER

The Surgical Treatment of Spontaneous and Traumatic Intracerebral Hæmorrhage. Grant, F. C. and Austin, George, M.: *Am. J. M. Sc.*, **219:** 237, 1950.

This article reviews 14 cases of intracerebral hæmorrhage operated upon for evacuation of the blood clot, 5 of the cases being traumatic in origin and 9 spontaneous. The authors review the causal factors in spontaneous intracerebral hæmorrhage and point out the importance of late bleeding into those areas of brain tissue damaged by earlier trauma, the areas having been either softened by necrosis or the site of many small capillary hæmorrhages.

In the 14 cases the cerebral bleeding was the cause of immediate death in none. The shortest period between the onset of symptoms indicating the occurrence of hæmorrhage and the patient's death was two hours. In several cases, months had elapsed before the patient came to operation. Coma, either following a convulsive seizure or as the culmination of progressive stupor, was, with motor weakness, the most common single feature. Papillœdema was uncommon, pupillary changes of varied nature were frequently noted. Cerebrospinal fluid pressure elevation was present in half the cases examined. At operation the most frequent single site of the bleeding was in the temporal lobes. This is in accordance with experience in other clinics in which one-half to one-third of the cases of intracerebral bleeding is so situated. The clot was evacuated in 7 of the 14 cases via a simple burr lobe. Six cases required craniotomy. The overall mortality was 28.6%.

The authors conclude that it is worth while to attempt evacuation of any known intracerebral hæmorrhage not involving the brain stem. G. A. COPPING

The Occurrence of Infection after Pulmonary Resection. Miller, C. C. and Sweet, R.H.: *New England J. Med.*, **240:** 589, 1949.

A series of 427 cases of lung resection at the Massachusetts General Hospital in a six-year period (1942-1947) is reviewed in regard to the effect of chemotherapeutic and antibiotic medication. A significant decline in infection and mortality rates, and in length of hospitalization, is demonstrated. Drug therapy in lung resection must be adequate and must be given both before and after operation. Instillation of both penicillin and streptomycin into the pleural cavity at the conclusion of operation is believed to be beneficial. All cases should be studied bacteriologically and the proper agent and dose selected for the individual patient. Failure of lung expansion from bronchial obstruction following operation calls for prompt bronchoscopic aspiration. Any appreciable pleural effusion should be promptly aspirated with instillation of penicillin and streptomycin.

The routine chemotherapeutic program recommended by the authors for lung resection consists of 100,000 units of penicillin every eight hours and 0.25 gm. streptomycin every six hours (both intramuscularly) for two days prior to operation. Aerosol penicillin, 50,000 units in one c.c. physiologic saline, with or without streptomycin (0.25 gm.) as indicated, is used four times daily before operation if there is profuse expectoration. At the close of operation 100,000 units of penicillin and one gm. streptomycin dissolved in 30 c.c. physiologic saline are instilled into the pleural cavity. Intramuscular penicillin and streptomycin are then continued for five or six days or until the temperature has been normal for three days.
NORMAN S. SKINNER

Extrarenal Azotemia. Appel, C. F. and Townsend, J. H.: *New England J. Med.*, **240:** 95, 1949.

Extrarenal azotæmia produces the picture of renal failure without actual renal disease. The more important signs include an elevated non-protein nitrogen, uræmic odour to the breath, dehydration, electrolyte loss (especially of chloride) and oliguria or anuria. Distinction from the uræmia of renal disease is evident in the normal eye-grounds, normal blood pressure and normal specific gravity of the urine. Casts, red cells and white cells may be present in the urine but these characteristically disappear. Extrarenal azotæmia may be associated with coronary thrombosis, alkalosis, pyloric obstruction, peritonitis, liver-kidney syndrome, yellow fever, gastro-intestinal hæmorrhage, postoperative complications, congestive heart failure, reactions to transfusions and to intravenous therapy, Weil's disease, Addison's disease, pneumonia, allergy, diabetes, shock, acute pancreatitis, diarrhœal disease, heat cramps, drug intoxications and burns.

The important factor in the pathogenesis of the condition appears to be a diminished renal blood flow which is reversible in many cases provided treatment is started early. Fluids and electrolytes must be supplied in adequate amount. NORMAN S. SKINNER

Surgery

Parenteral Nutrition in the Surgical Patient is provided from Glucose, Amino Acids and Alcohol. Rice, C. O., Orr, B. and Enguist, I.: *Ann. Surg.*, **131:** 289, 1950.

It is demonstrated that the diet of a postoperative patient in hospital is inadequate in calories and protein, especially during the first day or two after operation. If full nutrition is provided there is a sense of well-being and a more satisfactory convalescence. Alcohol given intravenously is a sedative and analgesic as well as a source of calories. After experimental work, it was found that about 15 c.c. of 98% alcohol per hour in amino acids and 5% glucose provides a practical rate of administration for the average adult. Morphine becomes unnecessary. A positive nitrogen balance is more easily attained when glucose and amino acids are supplemented with alcohol to provide adequate calories. There is a wide range of safety between the therapeutic dose, the intoxicating dose and a lethal dose of alcohol. Also noted were a definite decrease in the incidence of paralytic ileus and gas pains—thought to be due to better nutrition. The glucose, amino acid and alcohol mixture was usually given in two four-hour, 1,000 c.c. doses per day, with vitamins B and C and electrolytes added as indicated.
BURNS PLEWES

Concerning the Unfavourable Late Results of Certain Operations performed in the Treatment of Cardiospasm. Barrett, N. R. and Franklin, R. H.: *Brit. J. Surg.*, **37:** 194, 1949.

In a follow-up study of 25 patients who had either œsophago-gastrostomy or cardioplasty for cardiospasm it was found that the apparently highly successful results they felt for the first six months after operation were not maintained. Some patients were satisfied when they compared their existence with that which obtained before operation, some became dangerously ill, and all are abnormal in one or more respects. The late harmful results are not due to the method of anastomosis, nor to the suture material used, but follow the abnormal communication between stomach and œsophagus. Regurgitation of gastric contents into the œsophagus causes œsophagitis with symptoms of heartburn, pain in the chest, and bleeding. Heller's operation, which is an extra-mucous œsophago-cardiomyotomy, does not interfere with the valve mechanism at the œsophageal-gastric orifice and was not followed by œsophagitis.

The pathology caused by gastric regurgitation is described. Several patients were re-operated upon. If the anastomosis could be undone and a Heller's operation done, results were satisfactory. Satisfactory too were secondary gastroenterostomy or partial gastrectomy, or resection of the lower œsophagus and œsophago-jejunostomy. Great care should be shown in choosing the type of operation to be done on a patient with achalasia if he is not to be left in a worse position than he was originally.
BURNS PLEWES

The Problem of the Localized Surface Intracranial Hæmorrhage Causing Compression of the Brain. Whalley, N.: *Brit. J. Surg.*, **37:** 212, 1949.

Extradural hæmorrhage occurs in only 1 to 2% of head injuries but is important because life can be saved and morbidity rates are minimal. In 15 cases the recovery rate was 80%. In 1/3 of the cases there was no latent period. In 4 cases there was no period of initial unconsciousness. The latent period varied from half an hour to 4 days. Severe headache and mental confusion was the commonest symptom, and was quickly replaced by drowsiness. Signs of weakness and spasticity of the opposite limbs, convulsions, rapid then slow and irregular respirations ensue. Fixation and dilatation of the pupil is late. The stages may be run together with such rapidity that the phases are missed when a large arterial trunk is ruptured. When the bleeding is slow, neurological signs may be few and deepening unconsciousness may take several days. The typical textbook picture was seldom seen in this series. Most showed bruising of the external scalp over the clot. X-rays of the skull may be negative for fracture in the presence of an extradural clot. Local anæsthesia is preferable in deeply unconscious patients. Multiple burr-holes on both sides may be necessary before the clot is found. In both extradural and subdural hæmorrhage, the diagnosis is a clinical one. Spinal puncture may be of some value in cases with no latent period and few neurological findings. Delay in operating may prove disastrous.
BURNS PLEWES

L'action de l'auréomycine sur la flore bactérienne du tractus intestinal de l'homme; contribution à la préparation préopératoire. Heilman, F. R.: *Proc. Staff Meet., Mayo Clin.*, **25**: 87, 1950.

Depuis sa fondation, la Clinique Mayo, particulièrement organisée en vue des services de chirurgie, s'est efforcée par des recherches incessantes, à éliminer toute flore bactérienne intestinale nocive, comme mesure essentielle préopératoire à l'acte chirurgical sur l'intestin. En conséquence, le travail actuel, logique continuation de ceux déjà réalisés, a été entrepris dans le but de déterminer la valeur de l'auréomycine comme agent antibiotique dans la flore intestinale de l'homme, et d'établir les effets comparatifs de l'auréomycine, de la sulfasuxidine, de la sulfathalidine et de la dihydrostreptomycine. Par ces études expérimentales, l'auteurs a cherché à préciser notamment le plus court temps nécessaire à l'élimination des bactéries de l'intestin. Le mode d'expérimentation et les résultats obtenus jusqu'à présent, sont exposés, et représentés en 10 tableaux qui complètent le texte.

Les conditions préexistantes suivantes entravent ou empêchent l'élimination intestinale des bactéries susceptibles de se développer en milieux de culture: les perforations intestinales, associées aux abscès collectés, les fistules intestinales diverses, l'obstruction intestinale. Ces états pathologiques interviennent probablement pour prévenir le contact des agents antibiotiques sur les microorganismes. Pour la chirurgie intestinale, l'auteur recommande l'auréomycine per os, à raison de 750 mg. quatre fois par jour, pendant trois jours ou trois jours et demi. A cette dose cependant, l'action toxique peut se manifester éventuellement par des nausées, des vomissements et une diarrhée légère. Les nausées peuvent être atténuées par l'hydroxide d'aluminum per os ou par l'ingestion simultanée d'aliments. L'administration d'auréomycine doit être particulièrement surveillée chez les malades souffrant d'ulcère duodénal. Deux malades, hors série, ont perforé leur ulcère duodénal consécutivement à l'administration d'auréomycine.

En conclusion, l'auréomycine d'après l'auteur est le médicament qui jusqu'à présent, s'est montré le plus efficace pour neutraliser ou éliminer la flore intestinale chez l'homme. PIERRE SMITH

Obstetrics and Gynæcology

Actinomycosis of the Ovaries and Fallopian Tubes. Paalman, R. J., Dockerty, M. B. and Mussey, R. D.: *Am. J. Obst. & Gynec.*, **58**: 419, 1949.

Actinomycosis of the ovaries and Fallopian tubes is one of the less common, yet serious, diseases of the female pelvic viscera. It is a disease with which every gynæcologist and abdominal surgeon should be familiar. The causative organism usually is *Actinomyces bovis*. The organism is a normal inhabitant of the alimentary tract, which usually is the origin of the infection, although entry by way of the vagina is possible. The habit of chewing grain or grasses and contact with animals or human beings afflicted with actinomycosis are not etiologic factors in the disease. The Fallopian tubes and ovaries are the usual sites of the infection. The gross pathological picture is one of a spongy, honeycombed, granulomatous mass with adhesions and sometimes with sinuses to surrounding structures. The microscopic picture is that of multiple abscesses encased in a granulomatous fibroblastic stroma. The fungi are typically found in the abscesses and in the lining of the accompanying sinus tracts. Actinomycosis spreads by direct extension or by the blood stream. It rarely spreads by way of the lymphatic vessels. The clinical picture of the disease is not characteristic and is similar to pelvic inflammatory disease of other causation. The positive diagnosis depends on the finding of colonies of the organism bacteriologically or pathologically.

The treatment of actinomycosis of the female pelvic viscera is both surgical and medical. Radical removal of all diseased tissue is the surgical ideal. Although iodides and roentgen therapy still have a place in the medical program for actinomycosis, therapy with both sulfonamide drugs and penicillin administered in large doses over protracted periods gives the best results. In spite of radical surgical treatment and chemotherapy the prognosis of this disease is still to be regarded as serious. ROSS MITCHELL

Pregnancy and Tuberculosis. Schalfer, G.: *Am. J. Obst. & Gyn.*, **58**: 503, 1949.

The incidence of tuberculosis complicating pregnancy when fluoroscopy and x-ray are used in the antepartum examination is approximately 2%. The maternal mortality in the series under review (116 cases) was 19.8%; 87% of the deaths occurred in the far-advanced group. The mortality in the far-advanced group delivered by Cæsarean section was 33.3%, whereas the mortality in the far-advanced group delivering spontaneously was 63.1%. Parity has no effect on pulmonary tuberculosis. The mortality when tuberculosis is diagnosed during pregnancy is almost twice as great as when it is diagnosed before pregnancy. The important factor for prognosis for the pregnant, as well as for the non-pregnant woman, is the extent and type of the tuberculosis lesion and the rapidity with which treatment can be instituted. Prolonged, severe labour is to be avoided in pulmonary tuberculosis. Nembutal for analgesia combined with local anæsthesia has given good results. Cæsarean section has a definite indication in selected cases of tuberculosis.

None of the infants born had evidence of prenatal or postnatal tuberculosis. The infant mortality was 1.7%. ROSS MITCHELL

Diagnosis and Management of Rupture of the Uterus. Gordon, C. A. and Rosenthal, A. H.: *Am. J. Obst. & Gynec.*, **58**: 117, 1949.

The clinical data of 64 deaths from rupture of the uterus are presented; 27 were spontaneous, and 37 were the result of trauma. In all but three cases, rupture took place in the lower segment of the uterus. The rôle of cervical scarring in the etiology of rupture is emphasized. Internal version is the most frequent cause and should be recognized as an extremely hazardous procedure under certain unfavourable conditions. That strong fundal pressure can rupture a uterus is shown by three cases in this series. Four deaths occurred from the use of pituitary extract during the first stage of labour. Despite this, the judicious use of minute doses in carefully selected cases of uterine inertia is advised.

The diagnosis of rupture of the uterus is often not made sufficiently early for survival of the patient. Routine exploration of the uterus after traumatic vaginal procedures is indicated, especially if shock is present. The essence of adequate treatment for complete rupture of the uterus is prompt massive blood transfusion and hysterectomy. Shock is no contraindication to operation. ROSS MITCHELL

Rupture of the Uterus. Watt, G. L.: *Am. J. Obst. & Gynec.*, **59**: 490, 1950.

A group of 15 cases of rupture of the uterus occurring in the Toronto General Hospital during the 20-year period, 1927 through 1946, has been studied and serves as a basis for clinical discussion. Spontaneous rupture would occur much less frequently if pituitrin were used more wisely, and if obstetricians were alert to the dangers of relative disproportion in multiparous patients. Slightly less conservatism with regard to Cæsarean section is advocated. The number of manipulative ruptures with their extremely bad results could be materially reduced, if the complication leading up to the manipulation were recognized earlier and Cæsarean section resorted to. Version and breech extraction are condemned, and where difficult manipulative deliveries have taken place the whole of the uterus should be

explored. If rupture is found, transfusion and laparotomy should be resorted to at once. "Once a Cæsarean always a Cæsarean" is undoubtedly the safest rule to follow. Any continued deviation will eventually result in the rupture of a scar, placing the mother's life in jeopardy and causing almost certain death for the child. Due to the very high incidence of previous classical Cæsarean sections in any series of ruptures of a previous scar, low cervical section should be done exclusively whenever this operation is indicated.

ROSS MITCHELL

Neurology and Psychiatry

Psychiatry's Contribution to Family Life. English, O. S.: *Marriage and Family Living*, **12:** 3, 1950.

In psychiatry and psychosomatic medicine an increasing emphasis is being placed on the emotional interrelationships within the family as a focus for the prevention of individual disorders. Psychiatrists who act as consultants to family agencies and marriage council agencies are adding to their knowledge of emotional dynamics and contributing to the improvement of family life. Such experience indicates that the emotional health of children throughout the rest of their life is dependent upon the family having values within itself which could not be supplied by any other means without social changes which would be incomprehensible to the average citizen. The core of these values is love, in the sense of a force directed toward friendly co-operation. This can only be learned in a family where it exists, and far too many families are the transmitters of more negative feelings. The details of the balance between immaturities and mature attitudes, and the stages in human development at which maturation is often delayed, are matters of knowledge among the various professional people dealing with family problems. There is need for more widespread communication of such knowledge if many of the illnesses now recognized to arise on an emotional basis are to be prevented. W. DONALD ROSS

Newer Developments in Psychiatry. Solomon, H. C.: *Digest, Neurol. & Psychiat.*, **18:** 58, 1950.

Experimentally Produced Abnormal Mental States. Hoch, P. M.: *Digest, Neurol. & Psychiat.*, **18:** 154, 1950.

This is a pair of abstracts of talks given at the Institute of Living in Hartford which illustrate one current approach to psychiatric research: the production of psychotic symptoms under experimentally controlled conditions. Methods of producing or modifying psychotic symptoms which can be studied experimentally include: (1) The administratin of ACTH for more than 20 days; (2) DST (diisopropyl fluorophosphate); (3) lysergic acid; (4) electroshock therapy; (5) insulin coma; (6) psychosurgery, possibly through effects on the autonomic nervous system and eventually on enzyme chemistry and the nucleoprotein content of the nerve cell; (7) psychotherapy. Mescaline is another drug which can produce psychotic symptoms. It induces schizophrenic symptoms in non-deteriorated schizophrenics, latent schizophrenics, and in schizothymic normals. It produces organic symptoms in non-schizothymic normals and has little effect at all on burned-out chronic deteriorated schizophrenics. Its effects are abolished rapidly by intravenous amytal. Such investigations require a very comprehensive approach, embracing biochemistry, neurophysiology, and psychodynamics. W. DONALD ROSS

The Importance of Psychiatry in Surgery. Ochsner, A.: *Digest, Neurol. & Psychiat.*, **18:** 91, 1950.

The surgeon who is the author of this paper expresses the opinion that older physicians and surgeons who practised the art of medicine were in reality good psychiatrists. Much of this art has been lost, and it must be replaced by close collaboration between surgeons and psychiatrists. Sometimes a mutilating operation such as an amputation or a mammectomy may be indicated organically and yet leave the patient as a person worse off than he would have been with the risks of less radical procedures. A study of appendectomy cases conducted at Vanderbilt University indicated that 28% of these were found to show no pathological changes in the appendix or elsewhere in the abdomen. All of these patients had been found, by psychiatric examination made independently, to be neurotic, along with a much smaller percentage of the appendectomy patients who had acute appendicitis or other abdominal disease. Patients with anxiety before appendectomy were worse from a psychiatric standpoint after the operation. Children under the age of 3 are particularly traumatized by the emotional experience of an operation. Psychiatric harm may be done to a patient by promising the relief of symptoms from an operation affecting an organ other than the one which is the site of the symptoms. Two types of individuals should be avoided most of all by the surgeon: the operation addict with scars of many operations, and the paranoiac who may sue or attack the surgeon because of the attack on him which he interpreted the operation to be. Too frequently the surgeon believes that the patient with a functional disorder is not ill. He should recognize the need of such individuals for psychiatric treatment, not necessarily by a psychiatrist, as well as the need for consultation with psychiatrists on the problems which may be made worse by operation. W. DONALD ROSS

Dermatology

Protein Deficiency in Cutaneous Disease. Guy, W. B.: *Arch. Dermat. & Syph.*, **61:** 261, 1950.

Guy's presentation, and the remarks of those who discussed his paper at the Section of Dermatology and Syphilology of the American Medical Association, chiefly had reference to observations on patients past middle life with œdema below the knees, but without cardiac decompensation and renal disease or varicose veins sufficiently severe to account for the œdema. With the œdema was associated varying degrees and types of chronic dermatitis, sometimes showing evidence of secondary infection. Although estimations of plasma proteins did not show any considerable degree of deficiency in Guy's cases, their dietary habits clearly indicated a very deficient protein intake. It was believed that these estimations did not show the true state of affairs as they did not take into account the total blood volume; it was also held that the critical level of œdema, normally set at 3 gm. per 100 c.c., which may be modified by anæmia, often is higher. Impaired liver function and the use of carbohydrate and fat to meet energy requirements, while giving apparent evidence of nitrogen-balance, are other factors which may pass unrecognized, so that it is held that a diagnosis of protein deficiency does not depend upon the finding of a low total serum protein or reversal of the albumin-globulin ratio.

A series of cases was described in which, in addition to topical medication (sometimes not very successful, for irreversible skin changes had occurred), dietary habits were corrected, high calory, high protein and high vitamin diet was administered, augmented by the oral use of protein hydrolysates. The results, especially in respect to the œdema, were in general satisfactory. The very interesting discussion which follows showed the views of the speakers to be in accord substantially with those of the presenter, and extended them to include pemphigus, supposedly associated with adrenal insufficiency, and its remissions occurring under such treatment, together with the use of androgenic hormone; also the question of the relationship om immunobiologic response and local infection in the presence of protein deficiency.

D. E. H. CLEVELAND

Anæsthesia

Premedication in Pædiatric Anæsthesia. Belton, M. K. and Leigh, M. D.: *Current Researches in Anæs. & Anal.*, **29**: 68, 1950.

The authors point out that there is a great variance of opinion as to the necessity and amount of premedication for children undergoing anæsthesia. They are inclined to feel that a certain sedative effect and some inhibition of secretions is desirable but do not want their patients semicomatose. The drugs used for premedication of children, their purpose and actions, and various systems of preoperative prescribing of drugs for children are all outlined in this paper.

The premedicant drugs can be divided into three main groups. One group is the sedatives and includes the barbiturates and occasionally avertin. The second group is the analgesics including opiates or opiate-like drugs; while the third group comprises the anti-parasympathomimetic drugs of the belladonna family. The barbiturates used most frequently are nembutal and seconal either orally or rectally by capsule and occasionally pentothal solution administered rectally as basal anæsthesia. The more common analgesics for children are morphine, demerol and codeine. The belladonna drugs are scopolamine and atropine. Very minute doses of morphine are used in infants and the opinion has sometimes been expressed that these do not play any appreciable part and that the use of atropine or scopolamine alone would be just as satisfactory. With this the authors do not agree as they feel that even small doses of morphine play an important rôle in slowing the excessively rapid breathing of the average infant under general anæsthesia. However they point out that absolute accuracy in mixing these minute doses (sometimes as small as gr. 1/480) is essential in order to obtain the desired effect on the respiration and yet not produce undue depression.

Various systems of premedication by other authorities are outlined as well as their own and the reasons for their alterations are given. They prefer scopolamine to atropine because of its longer and stronger effect in drying secretions and in keeping a clear airway. Finally the great importance of a proper psychological approach to the young patient is stressed as a necessary adjuvant to any scheme of premedication in securing a smooth, tranquil induction of anæsthesia.

F. ARTHUR H. WILKINSON

Industrial Medicine

Dusts of Clinical Significance. Frank, T. M.: *Dis. of Chest*, **16**: 89, 1949.

Diseases and disabilities caused by dusts are always of interest and importance. As a rule they are almost entirely from exposure during work. The author of this article defines dusts as solid particles of such minute size that they can be picked up and moved easily, even by minor air currents. After referring to the sources of the different types he classifies the ways in which inspired dust carried into the lungs causes harm, as follows: (1) the fibrotic responses some of them provoke. (2) increased susceptibility to infections such as tuberculosis. (3) providing a vehicle for entry of pathogenic organisms. (4) the inherent toxicity of the materials.

It is known that many dusts may cause disability in isolated instances; many others may, upon further investigation, prove to be of considerable significance. The author outlines existing information regarding hazard from various dusts. Silica is the dust of great and known hazards. Information is given as to sources, dangerous exposure, prophylaxis and association with tuberculosis. Other dusts are less well known. Asbestos—hydrated magnesium silicate—a dust related to silica, is known to cause great disability. Diagnosis of asbestosis in its early stages is not easy but is made on history of exposure together with a somewhat diffuse fibrosis of lung fields. Treatment is unsuccessful in reducing the involvement. The only effectual control is prevention. Cotton dust is considered noxious but the case against it is not clear cut. Reference is made to English and American reports on the subject. A recently recognized hazard is associated with the grinding, stamping, polishing and crushing of beryllium. The diseases associated with beryllium consist of a form of acute pneumonitis, irritation of the upper respiratory tract, skin and eyes, and a pulmonary granulomatosis. They may be fatal but usually are not.

MARGARET H. WILTON

Occupational Cancer Hazards Found in Industry. Hueper, W. C.: *Indust. Hyg. Newsletter*, **9**: 7, 1949.

In this article the author presents the picture of occupational cancer as found in industry today. He urges that research into all phases of it be carried on with increased energy. In this way in addition to conquering the recognized industrial cancer hazards, it will be possible to keep ahead of future developments and to discover environmental and occupational cancer-producing agents before they can do any major damage. He divides the occupational cancer-producing agents into two main groups, those of physical nature, and, those of chemical nature. Data are presented, which give an adequate although brief view of the various agents which, under certain occupational conditions, may cause cancer, and of the research for specific cancer-producing chemicals which has been carried on in different countries. With both physical and chemical agents, the type of contact as well as the chemical characteristics of the particular substance decides the location within the body, of the resulting cancers.

In evaluating alleged occupational cancer hazards and in adjusting claims made in such cases, competent and critical consideration must be given to the time and type of relation. Definite and constant relations have been shown to exist between the site and the time of appearance of an occupational cancer on the one hand and the type, intensity and duration of exposure to a particular occupational agent and the nature of the agent on the other hand. Recognition must be taken of the fact that the period of delay in the appearance of an occupational cancer after the start of the exposure may range from 5 to 50 years depending on the type of agent and the intensity of exposure to it. It is not essential that exposure to the cancer-producing agent be continuous. The demonstration of cancer-producing hazards in industrial operations depends on two types of evidence—epidemiologic and medical. The nature and the limitations of each are explained.

In the author's opinion, the importance of the discovery and study of occupational cancer-producing operations and agents is not limited to the industrial field. The data obtained are of immediate value in ascertaining the rôle which environmental agents may play in the causation of cancer in the general population.

MARGARET H. WILTON

Adolescent Attitudes to Starting Work. Jahoda, G.: *Occup. Psychol.*, **23**: 184, 1949.

That the present methods of preparing children for their occupational life are inadequate on the part of the school and probably also on the part of the employers, is indicated by the findings from a survey reported in this article. It shows also the need for vocational guidance as a continuous process, not a hasty improvisation during the last year at school, and it emphasizes the fact that successful adaptation probably depends to a considerable extent upon an understanding on the part of the employer of the psychological needs of the adolescent.

In this survey, the thirteen and fourteen year old pupils of two modern secondary schools near London were assigned an essay entitled, "My First Day at Work". Analysis of the imaginary experiences of these two hundred boys and girls gives indication of adolescents' attitudes to various aspects of work. Although the nature of the inquiry presented certain limitations, there emerged from it, certain interesting facts. (1) Nearly all the adolescents assumed that

they will be excited and nervous, yet there was a general display of zest and enthusiasm. (2) The choice of jobs when viewed in relation to the industries and trades predominant in the district, was fairly realistic. (3) Very few had an accurate idea of the physical and social conditions of the work they described. (4) The importance attached to the establishment of friendly relations with others, was marked. In some cases there was an expression of apprehension lest the work-mates might be indifferent or hostile. (5) In most cases, the attitude towards persons in authority was ambivalent. (6) In the essays, there occurred frequent reference to helpfulness combined with friendly and considerate treatment on the part of persons in authority. This no doubt shows a craving on the part of the adolescent for personal significance and status.

MARGARET H. WILTON

OBITUARIES

Dr. Norman B. Alexander, aged 72, died on May 28. He was born in London, Ont., and graduated from the University of Western Ontario Medical School in April, 1898. He practiced medicine in this city until the outbreak of World War I, when he became unit director for Soldiers' Civil Re-establishment, with which he remained until his retirement in 1929. He was a member of the London Club and the London Hunt and Country Club. Surviving are his widow and his son.

Le docteur Alphonse Barabé, résidant à Hull, autrefois de Shawinigan, est décédé le 22 mai, après une courte maladie, à l'âge de 52 ans. Il avait fait ses études à Québec où il avait obtenu, après de brillantes études à la Faculté de Médecine de l'Université Laval, sa licence en médecine. Il avait aussi fait des stages dans plusieurs universités et hôpitaux américains, afin de se spécialiser. Il laisse outre sa femme, une fille, et un fils.

Dr. George Miller Gibson, aged 75, died recently in Vancouver. Born in Perth, Ontario, Dr. Gibson practised medicine in Drumheller, Alberta, for many years. In 1941 he moved to Kaslo, B.C., where he became medical officer for Japanese internment camps. He is survived by his widow, three sons and one daughter.

Dr. Ernest M. Henderson, aged 67, died on May 7 at the Toronto General Hospital. President of the Toronto Academy of Medicine 1947-48, Dr. Henderson had been associated with Confederation Life as a part-time medical director before assuming full-time duties in 1945. Born at Cobourg, he attended Upper Canada College and graduated in medicine from the University of Toronto, later doing postgraduate work in London. Dr. Henderson was at one time a member of the board of governors of Upper Canada College and of the York Club, Toronto Hunt Club, Badminton and Racquet Club and in undergraduate days he was manager of the University of Toronto track team. He was also associated with the Church of the Redeemer and Grace Church-on-the-Hill. He is survived by his widow and three sons.

Dr. James Currie McMillan died on May 20 at Vancouver after a prolonged illness. Succeeding Dr. W. L. Watt as radiologist to the Winnipeg General Hospital when Dr. Watt went overseas early in the first World War, Dr. McMillan served in that position for thirty years. He may justly be termed a pioneer in modern radiology. Born in Minto, Man., he attended Brandon College, Manitoba College and the University of Manitoba from which he graduated in Medicine in 1907. He then worked under Dr. Watt and in 1916 went overseas as adjutant of the 11th Canadian Field Ambulance. On his return he studied radiology in New York under Dr. Lewis Gregor Cole, then became director of the Department of Radiology at the Winnipeg General Hospital. His list of memberships in medical bodies is long:—Fellow of the American College of Physicians, the Royal College of Physicians (Canada), American College of Radiology, a charter member of the Canadian Association of Radiologists, a life member of the Winnipeg Medical Society, and a past president of the Manitoba Medical Association. Through his ability as a diagnostician and teacher and his gift for making friends he made a deep impress on medical circles in the Canadian West. He is survived by his widow, a son, two grandchildren, a sister and two brothers.

Dr. William Fletcher McPhedran, aged 66, former assistant professor of medicine in clinical medicine at the University of Toronto, died unexpectedly on May 15, at Toronto General Hospital. Born in Toronto, he received his early education at Upper Canada College and obtained his bachelor's degree at University College in 1905. Two years later he received his doctor's degree in Toronto. Following this he took postgraduate training at Johns Hopkins in Baltimore. In 1934 he received his appointment as assistant professor of medicine in clinical medicine at the University of Toronto. He held this post until he retired from it about two years ago. Dr. McPhedran spent many years on the medical teaching staff in the out-patients department of Toronto General hospital and thus was able to bring to medical students a knowledge and practical understanding of the work they would soon be undertaking on their own part. Dr. McPhedran was fond of golf and took great delight in swimming and boating at his summer home on Georgian Bay. He was a member of Alpha Omega Alpha, an honorary medical fraternity, the Academy of Medicine and the Æsculapian Club. Surviving beside his widow is one son and two daughters.

Dr. James A. Murison of Powell River, B.C., and a former resident of Winnipeg, died on May 17, at his home. A graduate of the Manitoba Medical College in 1912, Dr. Murison left Winnipeg two years later. He was born at Dutton, Ont., 60 years ago, came to Winnipeg in 1907, leaving in 1914. Dr. Murison established a medical practice at Kindersley, Sask., and lived in that community until 1928, when he moved to Powell River. He is survived by his widow.

Le Dr Azarie Paquette est mort subitement le 7 mai; il a été foudroyé par une crise cardiaque, alors qu'il était au volant de sa voiture. Reçu membre du collège des médecins en 1922, le Dr Paquette avait fait ses études à l'académie LaSalle, d'Ottawa, au séminaire de Ste-Thérèse et à la faculté de médecine de l'université de Montréal. Par la suite, il fut pendant plusieurs années attaché à l'institut Bruchési. Outre son épouse, il laisse deux fils, et une fille.

Dr. W. Leroy Pedlow, aged 59, died suddenly in his Caulfield home on May 7. He was former honorary president of the Vancouver Medical Association and of the Pacific Northwestern Surgical Association. Dr. Pedlow was born in Hamiota, Manitoba, and graduated from the University of Manitoba. He came to Vancouver in 1919 after serving with the medical corps in the First World War, when he received the Military Cross. He served many years on the staff of the Vancouver General Hospital. He was a Mason. Besides his widow, Dr. Pedlow is survived by two sons. Another son was killed in the Second World War.

Dr. E. C. Schmukler, a graduate of McGill University, died on April 15 in Mantua, N.J. He graduated from Queen's University, Kingston, Ont., with a Bachelor of Arts degree in 1934, Dr. Schmukler received his M.D. degree from McGill in 1939. He interned at the Jewish General Hospital and at McMillan Hospital, Charlestone, West Virginia, where he practised before going to Mantua. He is survived by his widow, and a daughter.

Dr. Robert A. Thomas, prominent in the field of x-ray, died May 12 in Toronto. He was 72. He was

instrumental in installing the first x-ray in Grace Hospital in 1906. Veteran of the First World War, he served in France. On his return, Dr. Thomas took charge of the X-ray Department of Christie Street Hospital, where he continued in service for 25 years. He was a life-long resident of Toronto and a graduate from the Trinity University Medical School. Dr. Thomas was an honorary member of the Canadian Association of Radiologists, the Academy of Medicine and the Æsculapian Club. He was also a member of Ashlar Lodge, A.F. & A.M., the Granite Club and St. Paul's Anglican Church, Bloor St. He leaves his widow and a daughter.

Dr. R. B. White, of Penticton, B.C., died on May 2, at the age of 75. His death removed from our ranks an outstanding physician and citizen. Dr. White had practised in the Okanagan since graduating from McGill in 1896. He was known as "the doctor who never refused a call". Besides his medical work, he was very active in the affairs of the medical profession of B.C., and of the community in which he lived. He served on the Council of the B.C. College of Physicians and Surgeons for several terms, being President of the Council at one time: was coroner in his district, and held this position for a great many years. He was named Penticton's "Good Citizen" in 1948. He is survived by his widow and two sons.

NEWS ITEMS

Alberta

Dr. Roy L. Anderson is taking a postgraduate course in surgery in Sweden, Norway and England; he will be attending the chief surgical centres during his four months' trip and will be returning to Edmonton in the fall.

Drs. Norman J. Campbell and R. Ronald Wilson have opened a combined office for general practice in Edmonton. Both doctors did their postgraduate work in the Edmonton hospitals and are graduates of the University of Alberta.

Dr. W. J. Simpson has been practising the art for fifty-one years in Lacombe and later Millet and now at the age of eighty-six does not intend to retire until he is "disabled". We wish Dr. Simpson all the best for a fine record in medicine.

We are sorry to announce that Dr. T. Harold Field, while on a California trip required to be operated upon for a cerebral lesion; reports are that progress is being made and he should return to Edmonton shortly.

Drs. Kenneth Hamilton and Gordon Bell are attending the American Heart Association convention in San Francisco and will return following a "Cook's tour" of the cardiac centres of the west coast.

The work on the Children's Hospital in Calgary and the extension of the University Hospital in Edmonton are near completion. Plans are under way for extension of the Misericordia and the General Hospitals in Edmonton.

Dr. V. W. Krause has taken up practice in Mayerthorpe. Dr. Krause is a graduate of the University of Alberta and took his training at the Royal Alexander Hospital, in Edmonton.

The transfer of patients from the Winnipeg flood area has been completed and we in Alberta are only too pleased that we can be of assistance to our fellow practitioners of Winnipeg who have most certainly had an unfortunate experience and loss during the Red River overflow. W. CARLETON WHITESIDE

British Columbia

It is hoped that ground will soon be broken for the new Acadamy of Medicine building in Vancouver, at the corner of Burrard Street and Tenth Avenue. This building will house the B.C. Medical and Vancouver Medical Association offices, the library of the Vancouver Medical Association with reading rooms, council rooms and so on. It is hoped that later on an auditorium will be erected on adjacent property.

The Summer School of the Vancouver Medical Association has again completed a highly successful session: there was a very good attendance of out-of-town medical men. The speakers were of high calibre, and gave very generously of their time and effort, with lectures, clinics, etc. At a luncheon which was given for members of the Summer School, Dean M. M. Weaver, of the Medical Faculty of the University of British Columbia, announced that everything is now in readiness for the opening of the Medical School in September. All laboratories, dissecting rooms, etc., are adequately equipped and ready. A class of 60 students will be chosen from some 340 or more applicants. Dr. Weaver stressed, in his remarks, the tremendous importance of providing adequately for research, as one of the main objectives of those who are concerned with the organization of the School. Without this, he felt, the School would be of comparatively restricted value.

At the Spokane meeting of the Pacific Northwest Radiological Society held recently, Dr. R. W. Boyd of Vancouver was named president for the coming year; Dr. F. Bonnell of Victoria being elected second vice-president. The 1951 meeting of the Society will be held either at Vancouver or Victoria.

The 50th anniversary of the B.C. Tuberculosis Society was celebrated recently in Vancouver, where a convention was held from May 15 to 20 at the Hotel Vancouver. The new T.B. Institute building, with its sections for modern chest surgery, is rated as probably the most advanced example of institutions of its kind in North America. Dr. W. H. Hatfield, Director of the Provincial Clinic for Diseases of the Chest, is the President for 1950-51 of the Society, and acted as host.

The campaign for funds being made by the B.C. Division of the Canadian Arthritis and Rheumatism Society is well under way. The press has co-operated very loyally in support of the campaign, with feature articles and stories. J. H. MACDERMOT

Newfoundland

Dr. L. Miller, Deputy Minister of Health, has returned from the World Health Assembly.

The St. John's Clinical Society held its last meeting for the season this month. Dr. A. McNamara presented a paper on Obesity.

Dr. A. Nowell has joined the Staff of the Sanatorium at St. John's. J. B. SQUIRE

New Brunswick

Dr. J. K. Sullivan, of Saint John, attended the meeting of the Canadian Urological Association at Toronto.

Dr. A. E. Macaulay was honoured at the Saint John Medical Society dinner at the Byng Boys Club, prior to his retirement to Ontario. Physicians of all ages attended this happy function; pædiatric and geriatric groups both being in evidence. A presentation of travelling luggage sped our friend to his new home.

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Dr. H. B. Atlee, of Halifax, spoke on the subject, "Things I don't believe," at the annual meeting of the Moncton Medical Society. The attendance was over fifty doctors from Moncton, and vicinity. Dr. H. L. Ripley was chairman. Dr. Fred Whitehead, secretary of the N.B. Medical Society and Dr. Geo, White, were visitors from Saint John. The address of the evening was of such interest that the business portion of the meeting was postponed.

The N.B. Branch of the Canadian Cancer Society has sponsored three more short courses at the Cancer Memorial Hospital, in New York for three Moncton Physicians. Dr. P. D'Entremont studied surgical treatment of gastro-intestinal cancer and Dr. G. V. Parsons, made a special study of anæsthesia in cancer cases. Dr. Norman J. Belleveau of the Hotel Dieu Hospital, followed a special course of instruction at the same hospital.

Perhaps the record of vital statistics is not sufficiently stressed in these notes, but exceptions are sometimes justified. When a past president of the N.B. Medical Society has his family increased by a set of assorted twins it is certainly news of national interest. Dr. Donald A. Thompson of Bathurst is the proud father.

Dr. A. F. Van Wart has been appointed to the Senate of the University of New Brunswick, by the provincial government to replace Hon. J. B. McNair, resigned.

Dr. John R. Nugent and Dr. R. A. H. MacKeen, of the N.B. Cancer Advisory Committee visited Edmundston in April. Diagnostic cancer films were shown and nominations were made for a new pair of clinicians for the local clinic. Dr. R. J. Dolan of the N.B. Department of Health and Dr. Fred. Whitehead, secretary of the N.B. Medical Society spoke to the Edmundston doctors on administrative and medical economics problems.

Dr. George V. Hill a graduate this year from Dalhousie Medical School, is establishing a practice at Fredericton Junction, N.B. Dr. Hill had a most distinguished career in the R.C.A.F., in the last war when he won the D.F.C., with two bars.

Dr. F. B. Wishart, clinician of the cancer diagnostic clinic at Woodstock has been awarded a study grant at the Memorial Hospital at New York for postgraduate work in cancer diagnosis.

Lieut.-Governor, Dr. D. L. MacLaren, was the special speaker at the annual meeting of the Saint John Medical Society. Dr. Robt. Gregory was chairman. Governor MacLaren, whose family included many notable physicians was particularly acceptable as a medical speaker because of his personal interests in hospitals. For some time he has been president of the Board of St. Joseph's Hospital. His address was concerned chiefly with the problems of hospital finance and management and with the problem of medical care.

Recent appointments to the staff of the Saint John General Hospital included the promotion of Dr. F. J. Cheesman from assistant surgeon to surgeon. Dr. J. G. McLean and Dr. K. A. Baird, were appointed Dermatologists in the Department of Medicine. Dr. T. E. Lunney, received an appointment on the anæsthesic staff.

Dr. A. J. Losier, of Chatham, received an honorary degree of Doctor of Laws from St. Thomas College at the recent convocation.

Dr. A. T. Leatherbarrow of Hampton, was the guest of honour at Ridgewood Hospital, D.V.A., recently when the staff made him a presentation on his retirement from D.V.A. service.

Dr. Georges Dumont of Campbellton recently honoured by Pope Pius XII with a knighthood of the order of St. Gregory was again honoured by a large group of his hospital and medical colleagues and friends at a gathering in the Campbellton Hotel Dieu, marking the completion of 25 years of professional service to his community. In all branches of civic affairs Dr. Dumont has taken a prominent part.

A. S. KIRKLAND

Ontario

Dr. George F. Pennal has been appointed surgeon-in-chief of St. Joseph's Hospital, Toronto. A graduate from the University of Toronto in 1927 he obtained his master's degree at the University of Liverpool. He became a fellow of the Royal College of Surgeons at Edinburgh in 1940. During the war he was on the staff of No. 10 Canadian General Hospital and later surgeon in charge of No. 3 Casualty Clearing Station.

Donations totalling $75,000 already have been received for research projects and equipment for the new Charles H. Best Institute at the University of Toronto, even though ground has not yet been broken. One of the largest donations is $25,000 from Messrs. Burroughs Wellcome and Co. in the United States. Among other gifts to the Faculty of Medicine are $5,000 for medical research under the will of the late Dr. Neil McGillivray who graduated in 1935 and later was appointed associate in Medicine; $1,000 from Mr. and Mrs. Joseph Yolles, a memorial to their son, Louis, to finance work in cardiology; $846 from the Ladies' Auxiliary of the Academy of Dentistry for treatment in the Faculty of Dentistry Clinic of dental abnormalities such as cleft palate and congenital absence of teeth.

Dr. G. E. Hall, president of the University of Western Ontario, has been elected president of the National Cancer Institute of Canada.

Dr. J. C. McLelland, Toronto, has been elected president of the Canadian Urological Association.

Last year 194 European nurses, including one from Russia, and 233 nurses from other provinces of Canada applied for registration in Ontario. Some of the overseas nurses are able to fit into the Ontario picture without further training as soon as they have mastered the language. Some are placed as sub-staff in hospitals or given additional training to bring them up to Ontario standards. Twelve of the twenty-eight nursing registries in Ontario offer shared nursing care. There is need for an educational campaign regarding this shared care, contrary to some fears when it was introduced it is proving satisfactory to doctors, nurses, patients and hospitals. Miss Rhano Beamish, superintendent of Sarnia General Hospital, was elected president of the Registered Nurses of Ontario for another year.

Dr. Harvey Agnew, Executive Secretary of the Canadian Hospital Council since its inception in 1931, and editor of *The Canadian Hospital* has resigned to join the hospital consulting firm of Neergaard and Craig of New York City which will henceforth be known as Neergaard, Agnew and Craig. Offices are being opened in Toronto under the direction of Dr. Agnew who will continue as head of the course in hospital administration at the University of Toronto.

A group of fourteen, sponsored by the Liquor Control Board of Ontario, spent three days studying the problem of alcoholism at New Haven and Hartford, Conn. Major John Foote headed the group which included representatives of the clergy, temperance organizations and penal reform institutions.

Dr. A. E. Berry, director of the sanitary engineering division of the Ontario Health Department, received the Goodell prize for the best paper published in the water works field this year. His paper was based on a report on fluorination of public water supplies to reduce tooth decay.

The first diabetic survey undertaken in Canada was recently completed at Newmarket. Examination of 4,421 people resulted in the discovery of 21 unknown diabetics, there were 33 known diabetics in the town making a total of 54. The new diabetics were referred to the family physicians for treatment.

Dr. Andrew Zinovieff of Oxford is coming to Toronto to direct the new three-year course in physical and occupational therapy. In addition he will be consultant to the Workmen's Compensation Board and consultant at Sunnybrook Hospital. He was an R.A.F. Squadron Leader during the war, and later orthopædic specialist and medical officer in charge of R.A.F. officers' rehabilitation. Later he became medical officer in charge of the department of rehabilitation and physiotherapy at Oxford's Radcliffe Infirmary.

The fifteenth annual convention of the Ontario Society of Radiographers was held in the Royal York. A radiographer is a technician who takes x-ray pictures. More than one hundred of them attended the two-day convention. Last year a course was established at University of Toronto to give a training in this work and in related subjects; 16 completed the examinations. Already 15 have applied for next year. Edward F. Gunsen of Rochester had an interesting display of skull, bone and gastro-intestinal films; he showed an apparatus which does away with calculations on age, girth and obesity in x-ray photography. LILLIAN A. CHASE

Saskatchewan

During the months of May and June district medical society meetings have been sponsored throughout the whole Province by the College of Physicians and Surgeons. Meetings have been held at Swift Current, Moose Jaw, Weyburn, Whitewood, Yorkton, Tisdale, Prince Albert, North Battleford, Elrose and Saskatoon. Attendance and interest has been excellent, many doctors having travelled a considerable number of miles to be present.

The Registrar took some time to explain the privileges of the profession and define some of them, remarking that in return for these privileges the profession had certain responsibilities to shoulder. The remarks were particularly directed to the younger men entering practice but were also appreciated by the more experienced practitioners. Some further comments were made on the satisfaction of a full professional life and the history of the Saskatchewan Cancer Commission was reviewed.

At each meeting a member of the College was present to explain the organization of the Canadian Arthritis and Rheumatism Society and to enlist the support of the physicians as well as to show them how the Society might help them in their work. The rest of the meeting was taken up by showing motion pictures. The pictures shown were "Cancer and the Problem of Early Diagnosis", "Atomic Energy", from the Encyclopædia Britannica, "Conquer the Crippler" and "They Also Serve". The opportunity for a professional and social get-together is greatly appreciated at these times by all practitioners and especially by those who have been to a certain extent isolated during the winter months.

Monday, May 8, 1950, was an important day for the medical profession of Canada and the Province of Saskatchewan in particular. On that day the formal opening of the Medical College building of the University of Saskatechwan took place.

At the opening exercises held in the Auditorium of the Medical College the building was officially handed over by the Government to the Chairman of the Board of Governors of the University. The Honourable T. C. Douglas, Premier of Saskatchewan, in transferring the building to Mr. Arthur Moxon, K.C., Chairman of the Board of Governors, announced that agreement had been reached between the Government and the University to continue building the University Hospital and set a time table which will be adhered to as much as possible for its ultimate completion. In this time table it is expected that wing by wing will be added with a view to having a functioning hospital at the first opportunity, and expansion thereafter until the full hospital has been completed. This makes it possible to enlarge the medical course to a full degree course when the hospital construction and operation warrants.

In accepting the building on behalf of the Board of Governors of the University Mr. Arthur Moxon assured all those present that the building would be used for medical education and to promote the full degree course in medicine as its prime purpose. Mr. Moxon noted the history of the University and remarked upon the various periods of building activity within the University, paying tribute to the present Government for the part it has played in this last large period of expansion. Great tribute was paid by both speakers to the zeal and ability of Dean W. S. Lindsay. who has been with the University first as Professor of Pathology and later as Dean, and whose enthusiasm and wisdom has resulted in this great vision of today. Dean Lindsay spoke on the Saskatchewan Medical College and outlined the requirements for a first-class medical school, making it plain that medical education today rightfully belongs within the university and requires to have associated with it a proper university teaching hospital.

The guest speaker of the occasion was Sir Henry Dale, the eminent British scientist who has been crossing Canada on his way home to England and who gave an excellent address on medical research as an aim in life.

Dr. Auld, Chancellor of the University, was chairman of the formal opening and Dr. Lindsay had as his guest Dr. Fiddes, who was Professor of Physiology at the School of Medical Sciences for many years. Dr. J. F. C. Anderson, President of the Canadian Medical Association, and closely associated with the school in the Department of Medicine, and the Honourable T. J. Bentley, Minister of Public Health, completed the platform party. After the formal opening a tea and reception was held for the invited guests and their ladies who joined them for the reception. Mrs. W. S. Lindsay, Lady Dale and Mrs. Auld received the guests as they entered the College Library where the reception was held. Following the reception the guests toured the building to inspect the various laboratories and the teaching departments.

The official opening of the school made it possible in the evening to hold the First Tisdall Lecture in Saskatchewan, and Sir Henry Dale was the guest speaker. The subject was Chemotherapy. Tracing the history from the days of Ehrlich to the present remarkable results obtained with antibiotics, delivered in a superb scholarly fashion, it was an excellent lecture. The Auditorium was filled to capacity and it is hoped that this is a forerunner of the influence to be made by the College of Medical Sciences at the University of Saskatchewan.

Changes within the province are Dr. S. Golab from the Saskatchewan Hospital, Weyburn to Lampman; Dr. L. V. Laevens from Invermay to Kamsack; and Dr. B. Tolczynsky from Nipawin to Yorkton. Dr. L. E. Belcourt has joined his son, Dr. R. J. P. Belcourt, in practice at Radville. G. G. FERGUSON

General

The American College of Physicians announces that a limited number of Fellowships in Medicine will be available from July 1, 1951 to June 30, 1952. These Fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in

the early stages of their preparation for a teaching and investigative career in Internal Medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work. The stipend will be from $2,000 to $3,200. Application forms will be supplied on request to The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa., and must be submitted in duplicate not later than October 1, 1950. Announcement of awards will be made November, 1950.

The American College of Physicians will conduct its 32nd annual session at St. Louis, Mo., April 9 to 13, inclusive, 1951. Secretaries of medical societies are especially asked to note these dates and, in arranging meeting dates of their societies, to avoid conflicts with the College meeting for obvious mutual benefits.

The American Society for the Study of Sterility offers an annual award of $1,000 known as the Ortho Award, for an outstanding contribution to the subject of infertility and sterility. Competition is open to those in clinical practice as well as individuals whose work is restricted to research in the basic sciences. Essays submitted for the 1951 contest must be received not later than March 1, 1951. For full particulars, address The American Society for the Study of Sterility, 20 Magnolia Terrace, Springfield, Mass.

The Foundation of the American Society of Plastic and Reconstructive Surgery offers as its 1950 award $500.00 (first prize of $300.00, second prize of $200.00) and a Certificate of Merit, for essays on some original unpublished subject in plastic surgery. Competition shall be limited to residents in plastic surgery of recognized hospitals and to plastic surgeons who have been in such specific practice for not more than five years. Essays must be in before August 15, 1950. For full particulars write the Secretary, Dr. Clarence R. Straatsma, 66 East 79th Street, New York, N.Y.

The Fifth International Congress of Microbiology will be held in Rio de Janeiro from August 17 to 24 this year, under the auspices of the Ministry of Education and Health of Brazil. An invitation to attend the Congress should be addressed to the President of the Organizing Committee, Rio de Janeiro.

Book Reviews

The Rat in Laboratory Investigation. Edited by E. J. Farris, Associate Member in Anatomy, Executive Director, The Wistar Institute of Anatomy and Biology; and J. Q. Griffith, Jr., Research Foundation, Philadelphia. 542 pp., illust., 2nd ed. $18.00. J. B. Lippincott Co., Philadelphia, London and Montreal, 1949.

This book is the only satisfactory handbook for any laboratory using the rat as an experimental animal. It provides readily available information concerning fundamental procedures, clearly described and well documented. The second edition differs from the first primarily in the section on drugs and dosages which has been completely re-written. This chapter incorporates, in handy reference form, most of the advances and changes of the past seven years. Other changes are to be found in some small additions to the chapters on the maintenance of the animals and on special techniques applicable to the osseus system. It is to be regretted that since this is the only satisfactory book of its kind, its authors have not extended their revision to include even more recent material. Unfortunately, the bibliography in many of the chapters goes no further than it did in the first edition. Nonetheless, this book remains a most necessary requirement for anyone working with the rat.

Clinical Diagnosis by Laboratory Examinations. J. A. Kolmer, Professor of Medicine in the School of Medicine and the School of Dentistry of Temple University. 1212 pp., illust., 2nd ed. $12.00. Appleton-Century-Crofts, Inc., New York, 1949.

Investigation in medicine goes on so feverishly that a textbook has scarcely more lasting validity than an interim report. Textbooks must nevertheless be gratefully received for they aim to set forth, from the welter of facts and specious theories, an interpretative summary which may be accepted as sufficient for most practical needs. When an attempt is made, therefore, to bring all the ramifications of the hospital laboratory service within the confines of a single book it is but niggling criticism to dwell on the faults of commission or omission which incidentally attend such a formidable task. Professor Kolmer's work was widely commended when it appeared six years ago and in the second edition the high standard of the first is maintained. Much of the material has been re-written or radically revised, there are additional charts and tables and some thirty new subjects are introduced. Those who are familiar with the first edition will probably note that Professor Kolmer seems now less disposed to allow laboratory tests to supersede purely clinical findings. This change, although not drastic, should make the work more attractive for practitioners—it does not impair the laboratory value. In appraising this edition as a whole it may fairly be given high rank among the better medical books. It is at least the equal of any in its field and can be unreservedly recommended as a source of reference for extensive and reliable information.

Human Pathology. H. T. Karsner, former Professor of Pathology, Western Reserve University. 927 pp., illust., 7th ed. $14.50. J. B. Lippincott Co., Philadelphia, London, and Montreal, 1949.

This edition has two new very good additional chapters, covering diseases of the eye and diseases of the skin. The chapter on infectious diseases has been largely rewritten, rearranged and augmented by the inclusion of diseases that have recently come into increased prominence. There are many other additions and much rewriting, and although in some cases pathogenesis does receive full attention there is no question that Karsner's book maintains its high standard as an important contribution to pathological literature and is an excellent textbook, both for the undergraduate, graduate, and even the pathologist for purposes of reference.

Money, Medicine and the Masses. A. D. G. Blanc, B.Sc., M.B., Ch.B., A.N.Z.I.C. 193 pp. 10/6. A. H. & A. W. Reed, Wellington, New Zealand, 1949.

The author, a physician in Otago, New Zealand, has called upon "apt alliteration's artful aid" in choosing a title for this unsubstantial work, and he has made full use of the cliché and the catch phrase throughout the text. Despite its literary shortcomings, this book is not without its elements of interest, and in the aggregate it presents a revealing picture of the inroads of socialism in our sister Dominion. Dr. Blanc is a thoroughgoing socialist and his knowledge of the answers to all of our problems is automatic. His early chapters deal with the evils of the patent medicine business, and this leads him to a consideration of the pharmaceutical benefit under New Zealand's Social Security Act. Although the reader may doubt the accuracy of many statistical computations throughout the text, there is presented a table, apparently from official sources, which shows the astounding increase in expenditures for drugs since the inauguration of the compulsory health insurance plan in 1941. Expenditures under this heading have risen from £279,698 in 1941 to £1,558,350 in 1948, an increase of 450%.

This book is not recommended as an unbiased account of socialized medicine in New Zealand, but it does provide a useful summary of the situation from a viewpoint which is considerably left of centre.

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Books Received

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Books are acknowledged as received, but in some cases reviews will also be made in later issues.

Bridges' Dietetics for the Clinician. H. J. Johnson, formerly Assistant Clinical Professor of Medicine, New York Post Graduate Medical School, New York. 898 pp., 5th ed. $14.40. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1949.

A Synopsis of Obstetrics and Gynæcology. A. W. Bourne, Consulting Obstetric Surgeon, Queen Charlotte's Hospital, London. 522 pp., illust., 10th ed. $4.00. John Wright & Sons Ltd., Bristol; Simpkin Marshall Ltd., London; Macmillan Co. of Canada Ltd., Toronto, 1949.

Practical Anatomy. W. S. Le Gros Clark, Professor of Anatomy in the University of Oxford Fellow of Hertford College. 493 pp., illust., 2nd ed. $5.75. Edward Arnold & Co., London; Macmillan Co. of Canada Ltd., Toronto, 1949.

Infant Nutrition its Physiological Basis. F. W. Clements, Senior Medical Officer, Commonwealth Department of Health, Australia Chief, Nutrition Section, World Health Organization, Geneva. 246 pp. $4.00. John Wright & Sons Ltd., Bristol; Simpkin Marshall Ltd., London; Macmillan Co. of Canada Ltd., Toronto, 1949.

The 1949 Year Book of Obstetrics and Gynæcology. Edited by J. P. Greenhill, Professor of Gynæcology, Cook County Graduate School of Medicine. 629 pp., illust. $4.50. The Year Book Publishers Inc., Chicago.

Biological Actions of Sex Hormones. H. Burrows, C.B.E., Ph.D., F.R.C.S. 615 pp., illust., 2nd ed. $8.00. The University Press, Cambridge; Macmillan Co. of Canada Ltd., Toronto, 1949.

Pathology of Articular and Spinal Diseases. D. H. Collins, Reader in Clinical Pathology in the University of Leeds. 331 pp., illust. $6.75. Edward Arnold & Co., London; Macmillan Co. of Canada Ltd., Toronto.

Applied Anatomy and Kinesiology. W. P. Bowen, late Professor of Physical Education, Michigan State Normal College, Ypsilanti, Michigan. 6th ed. revised by H. A. Stone, Associate Supervisor, Department of Physical Education, University of California, Berkeley. 390 pp., illust. $5.70. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1949.

Epidemiology in Country Practice. W. N. Pickles, Medical Officer of Health, Aysgarth Rural District. 112 pp., illust. $2.00. John Wright & Sons Ltd., Bristol; Macmillan Co. of Canada, Toronto, 1939, re-issued 1949.

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References: in the case of a journal arrange as follows: author (JONES, A. B.), title, journal, volume, page, year. In the case of a book: WILSON, A., Practice of Medicine, Macmillan, London, 1st ed., p. 120, 1922.

Illustrations: A limited number will be accepted. Photographs should be clear: drawings should be in india ink on white paper. All unmounted. Legends to be typed separately.

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News: The Editor will be glad to consider any items of news that may be sent in by readers.

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NOTICE.—APPLICATION FOR INTERNSHIP AT ST. LUKE HOSPITAL. St. Luke Hospital in Montreal will consider the applications of doctors requesting rotating internship through its various services. St. Luke Hospital has a capacity of 456 beds and is approved by Canadian Medical Association and also approved by the American College of Surgeons; the quarters for interns were very recently furnished and offer first rate accommodation; salary, $75.00 per month through the first year; $100.00 per month the following year. Written applications should be sent to Dr. Harold Tétreault, St. Luke Hospital, 1058 St. Denis Street, Montreal, Que.

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POSITION VACANT.—Radiologist wanted for 150 bed General Hospital, active X-Ray Department in a growing City, present population 22,000, also serving a large rural area. Apply stating qualifications, experience and age. General Hospital, Chatham, Ontario.

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POSITION VACANT.—Certified ophthalmologist to join group in Western Canada. Excellent opportunity. Apply to Box 901, Canadian Medical Association Journal, 3640 University Street, Montreal.

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POSITION VACANT.—Competent physician, for full-time position, with large public clinic in Ontario desired. Some experience in tuberculosis preferable. Reply, giving age, qualifications and references, to Box 910, Canadian Medical Association Journal, 3640 University Street, Montreal.

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Books Received

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The Tuberculous Process. A. Leitch, formerly Tuberculosis Officer, Royal Chest Hospital. 175 pp. $2.40. John Wright & Sons Ltd., Bristol; Macmillan Co. of Canada Ltd., Toronto, 1949.

Bennett's Materia Medica and Pharmacy for Medical Students. Revised by H. G. Rolfe, Chief Pharmacist, The British Drug Houses Ltd. 276 pp., 5th ed. 16s. H. K. Lewis & Co. Ltd., London, 1950.

Essential Urology. F. H. Colby, Chief of the Urological Service, Massachusetts General Hospital. 580 pp., illust. $9.00. The Williams & Wilkins Co., Baltimore; Burns & MacEachern, Toronto, 1950.

Clinical Pathology. B. B. Wells, Professor of Medicine, University of Arkansas. 397 pp., illust. $6.75. W. B. Saunders Co., Philadelphia and London; McAinsh & Co. Ltd., Toronto, 1950.

Common Diseases of the Skin. R. C. Low, formerly Consulting Physician to the Skin Department, Royal Infirmary, Edinburgh; and G. A. G. Peterkin, Assistant Physician to the Skin Department, Royal Infirmary, Edinburgh. 282 pp., illust., 4th ed. 21/-. Oliver & Boyd, Edinburgh, 1949.

Modern Trends in Public Health. Edited by A. Massey. 581 pp., illust. Butterworth & Co. (Publishers), Ltd., London, 1949.

Das Intrakranielle Subdurale Hamatom. H. Krayenbuhl, Zurich; and G. G. Noto, Florenz. 175 pp., illust. Fr. 18.50. Medizinischer Verlag Hans Huber, Bern, 1949.

A Note on Some of the Scientific Studies Undertaken by Members of the Colonial Medical Service During the Period 1930-47, with a Bibliography. 43 pp. 1s. His Majesty's Stationery Office, London, 1949.

Primer of Allergy. W. T. Vaughan. Revised by J. H. Black. 175 pp., illust., 3rd ed. $4.00. The C. V. Mosby Co., St. Louis; McAinsh & Co. Ltd., Toronto, 1950.

British Surgical Practice. Under the General Editorship of Sir Ernest Rock Carling, Consulting Surgeon, Westminster Hospital; and Sir James Peterson Ross, Surgeon and Director of Surgical Clinical Unit, St. Bartholomew's Hospital. Vol. 6, 597 pp., illust. Butterworth & Co. (Publishers), Ltd., London, 1949.

Doctors of Infamy. A. Mitscherlich, Head of the German Medical Commission to U.S. Military Tribunal No. 1, Nuremberg; and F. Mielke. 172 pp., illust. $3.00. Henry Schuman, Inc., New York, 1949.